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No. 1.

THE DEVELOPMENT OF THE WINGS IN THE LEPIDOPTERA.

PLATES I-V.

BY WILLIAM FAIRFIELD MERCER.

The development of the wings inside of the body of the larvæ of insects with a complete metamorphosis is one of the most striking features in the transformations of insects; it is, however, one that is not generally understood. Although the fact that caterpillars have wings was discovered by Malpighi (1687) and by Swammerdam (1738), it is only in the last half of the present century that any exact information as to their method of development has been obtained; and this information is only just finding its way into the general text-books.

The beginning of the solution of the problem was made by Weissmann ('64 and '66) in his remarkable papers on the development of flies. These papers were followed by important contributions by Landois ('71), Ganin ('76), Dewitz ('81), Pancritius ('84), Schäffer ('89), Mayer ('96), Gonin ('92), and others. The most complete account that has yet appeared is that of Gonin.

Nearly two years ago, in the course of some studies of the development of the wings of *Pieris*, Professor Comstock came to the conclusion that in some respects the excellent account by Gonin was inaccurate. And at his suggestion I undertook the repetition of the tracing of the development of the wings in this insect. The following paper is the result of this investigation.

As Gonin's contribution appeared in a journal which is to be found in but few libraries in this country, it seems worth while to publish for American readers my complete results even though in many particulars they duplicate the results of Gonin.

It is with pleasure that I acknowledge the aid of Professor Comstock and his able corps of assistants: without this and the resources of the entomological department of Cornell University, which were put at my disposal, this investigation would have been impossible.

THE LIFE-HISTORY OF *Pieris*.

The observations on the number and duration of the stages of this insect were made on the July brood, which is one of the four broods of the year. The butterfly lays its eggs upon the food-plant of the caterpillar, sticking one at a time upon the leaves at varying distances. The egg hatches in from four to five days. As the caterpillar emerges, the head measures .36 mm. Excepting the first, the ratio of increase in head measurement at each moult is 1.55; in the case of the first moult it is slightly greater.

The caterpillar moults for the first time in from 30 to 48 hours after hatching. The head measures after this moult .6 mm. The caterpillar moults for the second time in from two to three days after the preceding moult, and the head measures .93 mm. In one day it moults again, and the head measures 1.44 mm. In one day more it moults again, and the head measures 2.22 mm. After four days it moults for the pupa, and seven days later the adult emerges. The butterflies pair when about 24 hours old, and the female at once begins to lay the eggs for a new brood. The whole life-cycle covers a period of about 22 days. The time of these changes varies somewhat with the nourishment and the temperature. These points are summed up in the following table:

	HEAD MEASUREMENT.
Egg 4 to 5 days.	
1st larval stage 30 to 48 hours . . . . .	.36 mm.
2d " " 2 to 3 days . . . . .	.6 mm.
3d " " 1 day . . . . .	.93 mm.
4th " " 1 day	1.44 mm.
5th " " 4 days (3 days active.)	2.22 mm.
	(1 day hung up.)
Pupa 7 days.	
Emergence to egg laying (Pair in 24 hours, begin to lay almost immediately).	

The caterpillar eats much and grows rapidly, and seemingly has nothing to do but to store up energy and fat to bring out the adult insect.

In moulting, the cuticle splits down the dorsal line of the first and second thoracic segments. During the latter part of the last larval stage the caterpillar ceases to eat and prepares to hang itself up for the pupal life. The approach of this event may be detected from the red color of the excrement, which is supposed to come from the cast-off cells of the epithelial wall of the alimentary canal. At the same time the caterpillar is searching about for a suitable place to hang itself up. It soon forms a button of silk to which it holds with its caudal prolegs and at once begins its girdle of silk over the thorax, fastening the ends to its support on either side of its body. The caterpillar is now shorter and changed in form somewhat as a preparation for pupation, which will take place in about 24 hours.

Throughout this discussion the term prepupal period is applied to the time the caterpillar is hung up before pupation. This period is characterized by the fact that the wings are outside of the body wall although beneath the larval cuticle, the change in position taking place while the caterpillar is spinning the silken support for the pupa stage.

TECHNIQUE.

The caterpillars were killed in hot water, small caterpillars being left in one-half minute, and large ones one minute.

Perenyi's fluid gave the best results as a fixing reagent. In fixing for wings the caterpillars were cut caudad of the third thoracic segment, and also the head was removed before placing them in the fluid. The chitinous coat that covers insects is very hard to penetrate, therefore to get a good fixation the greatest care is necessary. A large amount of the fluid in proportion to the caterpillars was used, the thoracic segments of from six to ten caterpillars being placed in from 30 cc. to 50 cc. of the fluid. The fluid was heated to 50° C., and the caterpillars transferred directly from the hot water and left from 8 to 12 hours in the fixing fluid. They were then hardened in successive grades of alcohol as follows:

70% Alcohol	.	.	.	.	.	24 hrs.
80% "	.	.	.	.	.	24 "
95% "	.	.	.	.	.	24 "
Absolute alcohol	.	.	.	.	.	12 "

Absolute alcohol and cedar oil, equal parts, 12 hrs.

Cedar oil, 24 hrs., or until the specimen was thoroughly cleared.

In the process of imbedding, the infiltration must be carefully done. To insure the best results, it is well to get the specimens into the hard paraffin and set them back into the oven for a few hours. This insures a uniform medium for cutting.

Sections cut from ten to fifteen microns thick gave the best results for the general outline, while for the finer cell structure sections seven microns thick were better. Sections were stained on the slide with hematoxylin and counter-stained with safranin to bring out the chitin. When staining with safranin it is necessary to leave the slides in for at least 24 hours, then differentiate very rapidly, dehydrate, clear, and mount all within a very few minutes. Orange G. was also found to give good results as a counter-stain for chitin.

For the study of the wings as a whole it is necessary to dissect them from the body and mount in glycerine jelly: the jelly must be cooled quickly in order to insure the tracheæ not being filled with it. To accomplish this, lay open the larva along the dorsal line and pin the cut edges of the tegument to the wax bottom of a dish, all being done under water. The wings are recognized as small flat bodies a little longer than wide. Figure 12 shows a drawing made from a photograph taken and mounted as above. The dissection of the pupal wings to bring out the tracheæ, for the study of the wings as a whole, is nicely brought about by placing the pupa in 4% formal for from six to ten hours; this hardens the tissues and at the same time leaves the air in the tracheæ, which appear as black lines under the microscope.

THE FIRST LARVAL STAGE. (Plate I, Figs. 1, 2, and 3.)

The wing-buds are found in the very earliest stages of the larval life; embryos were not examined. Figure 1 represents a section through the body-wall of one side of a thoracic segment at a point where a wing-bud is developing; *c* represents the cuticle and *h* the subjacent layer of cells, the hypodermis. The section was taken from a larva which was not more than one-half hour old. At a point opposite a trachea (Fig. 1, *t*) the cells of the hypodermis are elongated; these elongated cells constitute the rudiment of a wing or a wing-bud. Rudiments like this of organs that are not to be functional till the adult stage are often termed imaginal discs or imaginal buds. Near the center of the outer surface of this group of cells forming the

imaginal bud there is a slight depression beneath the cuticle (Fig. 1, *b*).

As the larva advances in age during this stage (Figs. 2 and 3) the elongation of the cells is increased, the depression enlarged, until finally the imaginal bud (Fig. 3, *ib*) is quite distinct and a thickening of the cuticle appears opposite a depression in the imaginal bud. This thickening began to show even in the early part of the stage. Near the trachea and the wing-bud there is in each case a group of cells which bear some resemblance to leucocytes and which were termed by Verson embryonic cells (*ec*); these are believed by Schäffer ('89) to be a sort of lymphatic gland, a center in which leucocytes are developed. From the study of these figures it is easily seen that the imaginal bud (*ib*) in this stage is simply a thickening of the hypodermis.

THE SECOND LARVAL STAGE. (Plate I, Fig. 4.)

In passing from the first stage to this, the growth of the wing-bud has been gradual and not very extensive. The cells have elongated somewhat and the small pit, referred to in the first stage, has increased to a definite invagination into which extends a chitinous plug (Fig. 4, *b*) from the cuticle.

THE THIRD LARVAL STAGE. (Plate I, Figs. 5, 6, and 6*a*.)

After the second moult the cells of the wing-bud have increased in length, the invaginating process has been going on until the wing-bud is deeply sunken in the body cavity; it remains, however, connected with the hypodermis by a thin membrane, the peripodal membrane (Fig. 5, *c*). The term peripodal membrane was proposed by Van Rees ('88) and was suggested by the fact that in the internal development of the legs of flies a similar membrane is formed: as the leg-buds and the wing-buds closely agree in structure the terms applied to parts of the leg-buds are also applied to the wing-buds. Figure 6 represents a section at a point which shows the peripodal membrane (*c*) on both sides. The trachea has increased in size. The plug of chitin at the opening of the invagination (Fig. 5, *b*) is readily noticed. To get a clear idea of the invagination it is necessary to study a series of sections through it. A section through the center of the invagination will show the chitinous plug (Fig. 5, *b*) and the opening into the

invagination. At a point two or three sections distant from the center, the invagination is closed in by the hypodermis of the body-wall (Fig. 6, *b*). The opening of the invagination is, therefore, a narrow pore.

The single layer of the hypodermis appears to pass into two or more layers in the wing-bud, but upon a careful examination it will be seen that there is but one layer, the nuclei of the cells being at different levels, while the cell walls may be traced from one side of the wing-bud to the other. In this stage, at the point of nearest approach of the trachea to the wing, there is a slight depression and the cells of the trachea are elongated slightly on the side toward the depression (Fig. 6).

Different specimens of larvæ in the third stage exhibit a great difference in the appearance of the basement membrane of the hypodermis of the body-wall. In some it is distinguished with difficulty, being merely a line limiting the inner ends of the hypodermal cells; which, in this case, are the same diameter throughout their length. In others the inner ends of the hypodermal cells are prolonged into delicate fibers between which are spaces; in this case the basement membrane connecting the tips of their fibers is remote from the main body of the cell (Fig. 6*a*, *bm*). In both cases the basement membrane of the wing-bud, which is directly continuous with that of the hypodermis of the body-wall, appears merely as a line bounding the ental surface of the bud. The tissue of the bud is solid, without the spaces represented in Figure 6*a*. It is, therefore, difficult in some specimens to distinguish the basement membrane of the wing-bud in this stage.

THE FOURTH LARVAL STAGE. (Plate I, Figs. 7-11: Plate II, Fig. 15.)

Sections of a larva taken in this stage (Figs. 7 and 8) show that the process of invagination has been going on at a rapid rate. The slight depression in the region of the trachea in the third stage (Fig. 6) has increased to a prominent evagination. It will be observed that in the course of this internal development of the wing there is first an invagination of the hypodermis, and later an evagination of a portion of this invagination. The evaginated portion is what is destined to become the wing; while the remaining, thinner portion of the invagination forms the peripodal membrane.

It is in this stage that a temporary set of tracheoles is developed. The cells of the epithelium of the large trachea near the wing-bud

(Fig. 7, *T*) are elongated on the side toward the evagination of the wing (Fig. 7, *mct*). A little later in this stage these cells appear very much larger with large nuclei (Fig. 8, *mct*). These cells are destined to form the tracheoles; and may be termed the mother cells of the tracheoles. In some of these cells, very fine tubes are seen, through which the light passes in the section. This is the first appearance of the temporary respiratory organs of the wing, or the tracheoles. Later in this stage the cells have wholly disappeared except the nuclei, and in their place are great bundles of capillary air tubes, the tracheoles, which differ from tracheæ in lacking the spiral thickening of the intima (Fig. 15, *tl*). The nuclei of these mother cells of the tracheoles do not disappear until after the development of the tracheoles (Figs. 10 and 11). It is evident from this that the tracheoles are not formed, as Landois supposed, from the nuclei of the cells, but from the body of the cells as described by Gonin. Figure 11 shows a group of cells in cross section, very much enlarged. In two of them the nucleus is cut through and appears, while in the other two the razor has not passed through the nucleus. In cutting across a group of cells containing a bundle of tubes, the section would show round holes, which is the case with these cells. Two other cells (Fig. 10) are shown in longi-section. These show the nuclei with a bundle of tubes surrounding them.

During this stage the tracheoles have no communication with the lumen of the large trachea about which they are developed. But as the new intima (Fig. 15, *oin*) is formed, which is to line this trachea in the next stage, it is not extended over the mouths of the tracheoles. It will be seen, therefore, that on the removal of the old intima (Fig. 15, *oin*) at the following moult, the air in the lumen of the trachea will have free access to the mouths of the tracheoles (Fig. 15, *mt*) which now become functional.

Proliferation of the Tracheæ.—At the very beginning of the fifth stage at the latest, and there is considerable evidence that in the latter part of the fourth stage, there begins the development of the permanent wing-tracheæ. These arise as a pocket-like evagination of the epithelial walls of the trachea that gives birth to the tracheoles. This is shown diagrammatically in Figure 9, *et*. This evagination is increased in size, and others are formed, some of which branch and extend into the lumen of the wing, following in a general way the course of the bundles of tracheoles. Figure 9 is diagrammatic to show more clearly

what is suggested in Figure 14, 7. These evaginations are extended into the lumen of the wing, which process takes place while the tracheoles are becoming completed and straightened out. The lumen of these small tracheæ in the wing has no connection with the main lateral tracheal trunk (Fig. 9, //), since they are closed by the pre-existing intima, therefore these tracheæ are not functional. As the tracheæ lengthen the tracheoles straighten out and extend to the margin of the wing. The tracheoles occupy the space, the vein cavity, along the course of the tracheæ as they push out into the wing. Ver-
son thought that the tracheoles never reached the margin of the wing, but my observations bear out those of Gonin who says they do extend to the margin of the wing unless hindered by the more dense portion of the edge of the organ. It is probable that the pressure of the air is the main agent in straightening out the tracheoles.

THE FIFTH LARVAL STAGE. (Plate II, Figs. 12-14, 16, 17. Plate III, Fig. 23.)

In the study of this period two methods were used, that of direct observation of the entire wing-bud and that of the study of sections.

The external lateral trachea sends out branches to the wing and these enter it at about one third of the distance from the hypodermal attachment to the margin and give the appearance, as Gonin states, of the stem of a nasturtium leaf (Fig. 12). The tracheæ seem to enter as into an arm pit and the tracheoles extend from this point to all parts of the organ, even to near the margin where the cells are denser and do not allow them to penetrate. The tracheoles extend in masses of bundles from the trachea as previously described. Tracheæ, being filled with lymph at this stage, are not easily seen in the entire wing-bud, but the photograph for Figure 12 was taken under very favorable conditions and they are faintly outlined.

Upon the study of sections (Fig. 14) it will be observed that the process of evagination has gone on from that described in the stage preceding this until the wing is nearly surrounded by the peripodal membrane (*e*). The evaginated portion is better shown in Figure 16 which is a frontal section of the larva and gives a longi-section of a part of the wing. In cutting the section shown in Figure 14 five layers of hypodermal origin were passed through, viz., the outside body wall or hypodermis (*h*), the external part of the peripodal membrane (*e'*), the external boundary of the wing-bud (*u*), the internal

boundary of the wing-bud (w), and the internal wall of the peripodal membrane (e).

The Parts of the Wing.—These can be best studied from the sections of the wings in various planes. Figure 13 shows a cross section of a wing through a vein cavity (v). This vein cavity contains a trachea (t) which is not functional, is filled with lymph, and contains no chitinous intima. This trachea consists of a single layer of epithelial cells which will finally change somewhat upon their internal margin and form the chitinous intima in a manner to be described later. In this vein cavity sections of tracheoles, both cross and longitudinal, are found; those in cross section appear as holes through a mother-cell (tl). Leucocytes (l) are also found.

In a frontal section (Fig. 16) the lateral trachea (T) is cut in longi-section, and the razor has passed through a wing trachea (t) in longi-section. This trachea has passed into the lumen of the wing (w). The tracheoles (tl) are connected with the lumen of the main trachea at a point (mt) while at the same time the chitinous intima (in) extends across the mouth of the trachea (t) which, as yet, has no chitinous intima and is not functional.

Figure 17 is a section of a wing in a slightly different plane than Figure 14; enough so that a mass of tracheoles (tl) appears instead of the bases of the developing trachee (Fig. 14, T).

During this stage the wing has been growing very rapidly and the ventral margin has extended toward the feet, and at the latter part of the period the wing changes from the inside of the body to the outside. This is all brought about while the caterpillar is searching for a suitable place to hang itself up.

The basement membrane (bm) is not easily distinguished in some sections in this period though quite distinct in others: it is shown in Figures 16 and 23. In many places between the vein cavities in the wing the two layers of the basement membrane appear as coming together and are somewhat fused. In some sections (Fig. 13) the line of union is seen with difficulty, but even in this section the line of contact is faintly made out by careful focusing. The union of these two layers forms the so-called middle membrane (Fig. 23, bm) which will be discussed more fully later.

THE CUTICLE OF THE WING-BUD.

There has been a long dispute as to whether or not a cuticle is formed around the wing-bud in the younger stages.

Pancritius thinks it is and figures it as a thick layer of chitin with the same structure as the outside cuticle of the body. Gonin thinks it is not formed at all until the latter part of the last larval stage. In *Sanninoidea exitiosa* (Fig. 20, *ic*) there is no doubt of a definite layer of cuticle surrounding the wing. In *Automeris io* there is a much more definite layer of cuticle; this is true in an early stage, even before the proliferation of the tracheæ (Fig. 21, *c*). The tracheoles alone are functioning at this period. The thick hard cuticle in this specimen may be traced quite a distance into the invagination; and it will be noticed that it gradually thins and finally becomes very thin and delicate. In *Pieris* the layer of cuticle extends in the form of a plug as described in the discussion of the first period, and the wingbud is not surrounded by a chitinous layer until the fifth stage when a very thin, delicate, structureless membrane of cuticular nature appears which is destined to become the cuticle of the wing of the pupa.

THE ORIGIN OF THE CUTICLE.

My observations indicate that the cuticle is a product of a transformation of the outer ends of the hypodermal cells instead of a secretion thrown out from these cells. By the use of chitin stains, the chitinous nature of the ends of the cells in the pupa wings (Fig. 35, *c*) is brought out. As more evidence that it is not a secretion, the cuticle in the development of the prepupal wing (Fig. 28, *pc*) is seen to gradually decrease in density as it approaches the hypodermal cells and gradually fades into the cells themselves. These facts have been observed many times and in many places upon the insect other than upon the wings, during the course of this investigation.

Several observers have noted that the cuticle is often divided into polygonal areas corresponding to the subadjacent hypodermal cells. It is not probable that this would be the case if the cuticle were a secretion thrown out from the cells; for in such a case the products of the different cells would naturally merge into a continuous layer. But the formation of a cuticle by a transformation of the outer portions of the body of the cells would result in the formation of such areas.

Ordinarily this division of the cuticle into areas is not very evident in sections. But in the case of one larva of *Sanninoidea exitiosa* the areas were remarkably distinct: so much so that the sections of the cuticle broke up into little blocks corresponding to the hypodermal cells (Fig. 37).

THE PREPUPAL PERIOD. (Plate III, Figs. 22-25; 27-28. Plate IV, Fig. 29.)

In all the previous stages of the caterpillar the wings are inside of the body cavity. In this stage they are found upon the outside. If one dissects the wings out in this stage, he finds it necessary to dissect away the body wall before he can get to the wings if he works from the inside as he did in the other stages. But if he takes the experience of Swammerdam and plunges the caterpillar into hot water a few times, then carefully takes off the chitinous covering, he will find the wings as external appendages the same as the legs.

For some time before the last moult, that is before the larva hangs itself up for the pupal period, the wings are transparent in the body, and their position is recognized only by their accompanying tracheæ. As the wing becomes gradually opaque it also becomes very much smaller and the contour is irregular and folded. The wings have now disappeared from the interior of the body, but are easily found in their new position by the method given above.

This change in position takes place in a very short time, while the caterpillar is searching for a place to hang itself up and spinning the button of silk to which it attaches itself. This is a very curious phenomenon, and one that needs explanation. Herold explains it easily. "The germs of the wing" he says "although hidden under the skin have a great tendency to come to the outside." Landois, who considered the wings as appendages of the tracheal trunk instead of an invagination of the hypodermis, thought that these germs opened a way through the muscular bed with their points and that then the hypodermis withdrew, thereby letting it appear under the form of an evagination of the integument. Weissmann and others have advanced the idea of the breaking down of the hypodermis to allow the wings to reach the outside. Dewitz does not refer to the breaking down of the hypodermis. According to him the opening of the cavity of the invagination is enlarged just enough to give a free removal of the wing and it remains for some time like a picture in a frame. Soon the wing becomes free and the hypodermal frame becomes a part of the body wall. Gorfin says, "This theory raises two principal objections. First, it is difficult for the orifice of the peripodal cavity to be able in a few hours to enlarge itself without a tear or rent; in the second place, in order that all of the envelope could find a place upon the thorax it would be necessary that the

circumference of it should be much increased. Now this is not the case. The second and third segments are swollen only while they contain the germs of the wings. After these organs issue the diameter does not exceed that of the neighboring segments." Gonin explains the transition of the wings according to the theory of the destruction of the envelope. As evidence of this he cites the fact of there being a large amount of debris around the wing and between the two layers of the integument. He also refers to the fact of having a series of slides in which the front wing is entirely exterior while the hind wing has not completed the transformation.

I have observed all this, but I believe that this structureless substance referred to by Gonin is none other than the moulting fluid. The reagents act upon this substance, coagulating it, which gives it the appearance of degenerating tissue. Stains act upon this substance very vigorously, even more so than upon the hypodermis. But since I find this structure around the entire larva (Fig. 29, *mf*) as well as around the wing, in about equal quantities, I believe it has no connection with broken down tissue.

A careful study of Figures 18, 19, and 20 which were taken from the peach-tree borer, Figure 18, from a caterpillar just before spinning its cocoon, Figure 19, from one which had begun to spin its cocoon, and Figure 20, from one which had just completed its cocoon, will show the method of the transition of the wing from the inside of the body cavity to the outside. It is found that the dorsal part of the wing (*d*) emerges first. Figure 18, *x* shows the two layers of the hypodermis, the one the external hypodermis and the other the peripodal membrane, drawn back a little but not fused as shown in Figure 19, *x*. The fusion of the two layers and the drawing dorsad in the direction of the arrow in the latter case is very evident. In the stage shown in Figure 20 the dorsal fold at *x* has entirely straightened out. During this time the wing has grown considerably as shown by the relative size of the figures, Figures 19 and 20 both being drawn to the same scale. The same result is shown by the ventral fold *y*. In the stage represented by the first two figures the walls have not fused, while it is easily seen that they are coming closer together in the course of the development. In the third case, represented in Figure 20, the walls have fused at *y* and drawn ventrally in the direction of the outside arrow. During the course of the development the wings now grow very rapidly in the direction of the

feet. From the very nature of this growth and the extent of it the peripodal membrane on the internal ventral side is swung dorsad in the direction of the inside arrow. Finally the ventral fold has straightened out as the dorsal fold did and the hypodermis has assumed the position shown in Figure 29, *y*. The wing is now on the outside of the body. The fused portion of the hypodermal wall is broken down and disappears with the development of the adult hypodermis. The ventral hypodermis approaches the dorsal hypodermis as the larva increases in age until there is only a narrow opening into the lumen of the wing (Fig. 29, *zw*) which corresponds more nearly to the lumen of the adult wing.

Gonin's objection to the idea of Landois, who thought the folds entirely straightened out thereby placing the wing on the outside of the body-wall, is not sustained. Gonin observes correctly that the thorax is not larger after the transition than it was before. According to my observations given above there would be no necessity for the enlargement referred to, for what slack there is is needed to form the ventral wall (Fig. 29, *y*) after the transformation has taken place. It will be seen also from the above description that the part of the fold that disappears is a small portion of the peripodal membrane and a piece of the hypodermal wall.

During the time of the last larval stage and especially during the latter part of it (prepupal period) the wings have been growing very rapidly. Now after the wings are on the exterior of the body this growth is even more rapid. The wings have reached the region of the feet and yet the growth is increasing. In order to allow this growth and still have the wings confined in the limits of the segments of their origin they become folded and wrinkled, so that the surface appears convoluted (Fig. 28). During this stage the wings become free and conspicuous in the section. A thin layer of cuticle is laid down upon the surface and follows the contour of the wings (Fig. 28, *pc*). This cuticle is thicker on the portions of the wing that will come to the air upon pupation, at the same time it must be very different in texture from the outside cuticle of the body for upon pupation it must needs straighten out as the wing expands.

On studying the wing-buds as a whole the tracheae can be seen, not because they are filled with air but on account of their chitinous intima (Fig. 22, *T*). Tracheoles (*tr*) are shown in the wing with their point of attachment in the axis of the wing. At the time the

caterpillar spins up, the tracheæ show very faintly but as the age increases they appear more prominent and the intima is very evident. During the early part and the middle of the last larval stage the tracheoles (Fig. 12, *tl*) are in great abundance, but in the prepupal stage they have begun to decrease in number and extent (Fig. 22, *tl*). As the caterpillar moults for the pupa the intima of the main trachea (Fig. 16, *in*) is pulled out which opens the mouths of the wing tracheæ and allows air to enter; and the tracheæ thus become functional. It is a question as to what now becomes of the tracheoles. Gonin says that they are drawn out at the time of this moult. He also says that this can be easily demonstrated. But the results of my observations are very different, as will appear later.

THE PUPAL WINGS. (Plate III, Figs. 24 and 26. Plate IV, except Fig. 29 and Plate V.)

During the pupal stage several important changes take place in the structure of the wing: the temporary or larval tracheoles disappear; a secondary or pupal system of tracheoles arises; important changes take place in the tracheæ; and a complicated series of changes takes place in the form of the hypodermal cells and of the basement membrane.

The Disappearance of the Temporary Tracheoles.—The temporary tracheoles are found in pupal wings (Fig. 26, *tl*) but not in such great numbers as in larval wings. They run in straight lines much the same as in the larval wings, but they are found only in the axial region of the wing, and that only in very young pupæ. They are attached to the epithelial wall of the trachea (Fig. 33, *tl*). This evidence will add to the proof of the theory of Landois and Pancritius who thought that the tracheoles of the larva disappeared by absorption in the pupa, and disapproves the statement of Gonin referred to above.

The Development of the Secondary or Pupal Tracheoles.—A new system of tracheoles now arises from the tracheæ. This may be called the secondary system of tracheoles. The two systems are entirely different and have no relation the one to the other. The temporary or larval system has its origin from the main tracheal trunk or from the bases of the wing tracheæ, while the pupal system has its origin from the tracheæ in the wing itself and functions during the pupal life. The secondary system extends at right angles to the tracheæ and penetrates the wing substance (Fig. 24, *tl*) while the

temporary system extends in straight lines from the axial region and follows the course of the tracheæ (Fig. 26, //) practically parallel with them and functions only during the larval life.

The Changes in the Structure of the Tracheæ.—In the very young pupa the tracheæ (Fig. 30, /) retain the characteristics of the tracheæ of the preceding stage except that the cells of the epithelial layer are not so distinct. This indistinctness increases with the age of the pupa until in the old pupa (Fig. 35, T) the walls between the cells have disappeared. At this time the epithelium appears under low powers to be thrown into folds; under high powers its degeneration is revealed. The nuclei are still quite distinct; but the cell body is becoming semi-transparent except in a branched central area where the protoplasm is of greater relative density. In this stage of the degeneration of the trachea the intima appears as a thin membranous structure in the lumen. Sometimes it appears merely as a line, at other times as a loop in a great variety of forms (Pl. V, Fig. 38, *in*).

In a later stage the inner boundary of the cells is broken down and the cell body is evidently disappearing. The central branched part of the cell body is the last to go (Pl. V, Fig. 39) and projects for a time into the lumen of the trachea.

A degenerating trachea in this stage is figured by Schäffer (his figure 37) and described as Semper's Flügelrippen (p. 646). He regards the branched remains of the cell body described above as tree-like processes of an intima, and the remains of the intima he believes to be a secretion from the walls of the tube.

Semper's original description of the so-called wing-ribs ('57, Taf. XV, Fig. 6) was evidently based on an examination of a trachea which had just begun to degenerate. The intima had separated from the epithelium and was mistaken for a central nerve, but the epithelial cells were still distinct and of the usual form.

This mistake of Semper has found its way into a large part of the literature on this subject and has been the cause of much confusion.

It is evident that this degeneration of the wing tracheæ finally becomes complete: for in the wing-veins of the adult the tracheæ are lacking.

The Changes in the Hypodermis and the Basement Membrane.—Our knowledge of the changes that take place in the course of the development of a wing has been greatly confused by what are evidently misconceptions regarding the nature of the membrane limiting the inner

ends of the hypodermal cells. This membrane is easily seen in the early larval stages to be continuous with the basement membrane of the hypodermis of the body wall and is obviously a homologous structure. In the fourth larval stage, the upper and lower hypodermal layers of the bud come together and the two opposed basement membranes appear as a single membrane; this has been termed the *middle membrane* of the larval wings, and its homology with the two basement membranes of the upper and the lower hypodermal layers of the wing overlooked. At the end of the fifth larval stage just before the evagination of the wings, which is characteristic of the prepupal period, the wing-buds become transparent so that they are seen in dissection with difficulty; their position, as already indicated, is recognizable only by the accompanying tracheae. In sections of the wing-buds made at this time, the so-called middle membrane is seen only with difficulty. This has given rise to the belief that it disappears at this time. Later when the wings become more opaque, *i. e.*, in the pupa stage, the two basement membranes are again easily seen. Semper ('57) believed that the reappearing basement membrane was a new structure, which he named the *grundmembran*; and he describes its formation from mesenchymatous cells that had wandered into the wing. The result has been that students of the subject have been confused by descriptions of three different structures, the basement membrane of the hypodermis, the middle membrane of the larval wing-buds, and the *grundmembran* of the pupal wing; when in reality there is only a single structure, the basement membrane.

The Development of the Venation of the Wings.—As stated above, during the fourth larval stage, the upper and lower hypodermal layers of the wing-bud come together, and the two opposed basement membranes appear as a single membrane, the so-called middle membrane. This union of the two layers of the wing does not take place, however, throughout the entire extent of the bud. Along certain lines, spaces occupied by tracheoles and lymph remain. These are the fore-runners of vein cavities, and into these the tracheae extend during the fifth stage (Fig. 12). In the fifth stage, therefore, the venation of the wing is outlined, each vein consisting of a cavity filled with lymph and containing a trachea. It is not, however, till the pupa stage that the wing-veins in the same sense in which the term is used by Entomologists (*i. e.*, the cuticular framework of the wing) are developed. These so-called wing-veins are merely thickened lines of the cuticle bounding the pre-existing vein-cavities.

In some cases the formation of a distinct vein-cavity follows the development of the trachea within. This is shown in the section represented in Figure 14. Here there is one large vein-cavity containing a trachea; but the other tracheae are closely surrounded by the hypodermal tissue of the wing. It is probable that this surrounding tissue is forced away later by blood pressure thus forming the large vein cavities characteristic of later stages.

The Formation of the Hypodermal Pillars.—During the prepupal period, that is between the time at which the wings pass out from the body cavity and the time of moulting the last larval skin, there is a great increase in size of the wings. This expansion is doubtless brought about by blood pressure. If there were no provision to prevent it, the forcing of the blood into the lumen of the wing would distend it like a filled bag. But the upper and lower sides of the wing are tied together by fibers of hypodermal origin, which have been termed the hypodermal pillars. The result is that the expanding of the wing is in a single plane.

According to the observations of Mayer ('96) the formation of these hypodermal pillars takes place in a complicated manner; but I have not been able to confirm his observations. In *Pieris* it takes place as follows:

During the period in which the two basement membranes are closely applied to each other, thus forming the so-called middle membrane, these membranes fuse in places, thus uniting hypodermal cells of the opposite sides of the wing. Later, at these points of fusion the fused basement membranes disintegrate, or at least are not to be distinguished from the bodies of the united cells, which form a fiber passing from one cuticle to the other.

When the wing is expanded, the hypodermal cells, each of which must cover a much larger area of the surface of the wing, are greatly shortened; and thus the two basement membranes are pulled apart except in those places where they have fused. Thus is presented the appearance shown in Figure 32, *b*, which represents a section of a vein cavity and several spaces between hypodermal pillars.

Later in the pupal stage, the hypodermal pillars appear to contract, for the two surfaces of the wing are brought even closer together (Figs. 31 and 35). In fact, in sections of wings of the adult very little hypodermal tissue can be found; and in many places the two cuticular layers are closely applied. The details of the disappearance of the hypodermal pillars have not been worked out.

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LIST OF ABBREVIATIONS USED IN THE FIGURES.

<i>i</i> . . . , beginning of the invagination of the wing.	<i>lt</i> . . . , lumen of trachea.
<i>bm</i> . . . , basement membrane.	<i>lv</i> . . . , lumen of wing vein.
<i>bmt</i> . . . , basement membrane tubes.	<i>lvb</i> . . . , lumen of wing-bud.
<i>c</i> . . . , cuticle.	<i>mt</i> . . . , mother cells of tracheoles.
<i>d</i> . . . , dorsal.	<i>mf</i> . . . , moulting fluid.
<i>ec</i> . . . , embryonic cells.	<i>mt</i> . . . , mouth of tracheoles.
<i>et</i> . . . , epithelium of trachea.	<i>nlt</i> . . . , new lumen of trachea.
<i>h</i> . . . , hypodermis.	<i>oc</i> . . . , outer cuticle.
<i>hp</i> . . . , hypodermal pillars.	<i>pc</i> . . . , pupal cuticle.
<i>ib</i> . . . , imaginal bud.	<i>T</i> . . . , principal trachea.
<i>ic</i> . . . , inner cuticle.	<i>t</i> . . . , small trachea.
<i>in</i> . . . , intima of trachea.	<i>tl</i> . . . , tracheoles.
<i>l</i> . . . , leucocytes.	<i>v</i> . . . , ventral.
<i>ls</i> . . . , lymph spaces.	<i>vd</i> . . . , vacuolated leucocytes.

EXPLANATION OF PLATE I.

Pieris rapæ.

Fig. 1. Wing-bud from cross section of larva one-half hour old.

Fig. 2. Wing-bud from cross section of larva a little older than the one represented in Figure 1.

Fig. 3. Wing-bud from cross section of larva a little older than represented in the two preceding figures, but in the same stage.

Fig. 4. Wing-bud from cross section of larva after the first moult (second stage).

Fig. 5. Wing-bud from cross section of larva after the second moult (third stage).

Fig. 6. Section of wing-bud three sections ahead of the one represented in Figure 5.

Fig. 6a. A few cells from a wing-bud of the same stage as represented by Figure 6.

Fig. 7. Wing-bud in cross section of larva after the third moult (early part of the fourth stage).

Fig. 8. Wing-bud in cross section of larva a little older than the one represented in Figure 7 (fourth stage).

Fig. 9. Diagrammatic figure showing the proliferation of the trachea.

Fig. 10. Longi-section of two mother cells of tracheoles.

Fig. 11. Cross section of four mother cells of tracheoles.

EXPLANATION OF PLATE II.

Pieris rapæ.

Fig. 12. Wing-bud of the fifth larval stage dissected out for direct observation.

Fig. 13. Cross section of wing-bud from the fifth stage.

Fig. 14. Section of the wing-bud in cross section of larva after the fourth moult (fifth stage).

Fig. 15. Section of trachea showing the connection of tracheoles (fifth stage).

Fig. 16. Section of the wing-bud in frontal section of larva (fifth stage).

Fig. 17. Section of wing-bud in cross section of larva cut in a different plane than the one represented in Fig. 14 (fifth stage).

EXPLANATION OF PLATE III.

Sanninoidea exitiosa.

Fig. 18. Wing-bud in cross section of larva just before spinning cocoon.

Fig. 19. Wing-bud in cross section of larva just spinning cocoon.

Fig. 20. Wing-bud in cross section of larva just in cocoon.

Automeris io.

Fig. 21. Section of wing-bud in cross section of larva before the proliferation of the trachea.

Pieris rapæ.

Fig. 22. Prepupal wing dissected out for direct observation.

Fig. 23. Section of the wing-bud in the fifth larval stage just before hanging up for the pupa stage.

Fig. 24. Trachea and secondary tracheoles in the young pupal wing.

Fig. 25. Cross section of prepupal wing under very high power.

Fig. 26. Trachea and larval tracheoles in pupal wing.

Fig. 27. Section of prepupal wing in cross section of larva.

Fig. 28. Section through one side of prepupal wing under high power.

EXPLANATION OF PLATE IV.

Figures all from *Pieris rapæ* except Figures 34 and 37 which are from *Sanninoidea exitiosa*.

Fig. 29. Cross section of the larva of the prepupal stage through the third thoracic segment.

Fig. 30. Cross section of very young pupal wing.

Fig. 31. Cross section of pupal wing about four days old.

Fig. 32. Cross section of pupal wing two days old.

Fig. 33. Trachea and larval tracheoles in pupal wing.

Fig. 34. Cross section of young pupal wing of the peach-tree borer.

Fig. 35. Cross section of pupal wing four days old. Section is through a vein cavity.

Fig. 36. Longi section of pupal wing two days old.

Fig. 37. Cross section of hypodermal layer of larva with cuticle. It shows the structure of the cuticle. (Peach-tree borer.)

EXPLANATION OF PLATE V.

Pieris rapæ.

Fig. 38. Cross section of trachea in old pupal wing.

Fig. 39. Portion of trachea in cross section a little older than the one represented in Figure 38.

NOTES AND DESCRIPTIONS OF ORTALIDÆ.

BY D. W. COQUILLETT.

***Amphicnephes fasciola*, sp. nov.**

Front blackish brown, the orbits whitish pruinose, their upper part and a small ocellar triangle, polished bluish black, antennæ black, the first two joints yellowish, face on lower part polished black, the remainder opaque, white pruinose, next the eyes narrowly yellowish, cheeks black, next the eyes yellowish, proboscis black, palpi brown, occiput greenish black; body dark green, more blackish green below, abdomen coarsely punctured, legs black, tarsi brown, first joint of the front ones and first three joints of the others, light yellow; wings hyaline mottled with brown, costal cell brown, stigma, except its apex, yellowish hyaline, bases of marginal and submarginal cells brown to slightly beyond apex of auxiliary vein, first basal cell brown except a subhyaline spot near its first third, second basal cell hyaline except a brown spot beyond its middle, anal cell hyaline except a brown border not extending along the sixth vein, axillary angle hyaline, discal cell brown except three hyaline spots, third posterior cell hyaline except three brown spots along the fifth vein, balance of wing hyaline, marked with three brown fasciæ, the first extending from apex of stigma to small cross vein, the second crosses the wing from before apex of second vein to apex of the fifth, the third fills the apex of first posterior cell and lower two thirds of apex of submarginal cell. Length, 4 mm.

Habitat: Onaga, Kansas.

A female specimen collected by Mr. F. F. Crevecoeur. Type No. 4468, U. S. National Museum.

***Rivellia basilaris*, sp. nov.**

Head reddish yellow, orbits and upper part of face whitish pruinose, upper part of orbits, ocellar triangle and occiput, blackish blue, proboscis dark brown; thorax and scutellum dark green or bluish, abdomen coarsely punctured, dark green, three basal segments yellowish, the third tinged with green in the middle; legs brown, femora, except toward their apices, and first two joints of middle and hind tarsi, light yellow; wings hyaline, a vitta and three crossbands, brown; the vitta extends from base of wing through first basal cell to the first cross-band, and fills costal cell to apex of auxiliary vein, bases of marginal and submarginal cells slightly farther, whole of first basal cell and encroaches on the discal; the first band extends from apex of stigma to fifth vein, passing over the small crossvein; the second extends from a short distance beyond apex of first vein to apex of fifth, passing over the hind crossvein; the third begins at upper end of the second and borders the apex of wing to tip of fourth vein, the subapical hyaline portion extends nearly halfway between the third and second veins. Length, 4 mm.

Habitat: Colorado and Baldwin, Kansas (C. S. Parmenter).

Three male specimens. Type No. 4469, U. S. Nat. Museum.

Urophora interrupta Macquart is a synonym of *Rivellia boscii*, and *Ortalis bipars* Walker, of *Rivellia viridulans*. Loew was correct in placing *Ortalis olivacea* Walker as a synonym of the last named species, with which the description fully agrees, while it does not at all agree with *Chetopsis aenea*, to which Osten Sacken assigned it from an examination of the supposed types.

Tephronota humilis Loew is a synonym of *Trypeta narytia* Walker. The fact that Walker attached the label to a specimen of *Chetopsis aenea*, as observed by Osten Sacken, is simply another instance of that author's well-known carelessness; his description of *narytia* agrees perfectly with *humilis*, while it is not at all applicable to *aenea*.

Our species of *Ceraxys* should be placed under *Meliceria* of Desvoidy (Essai Myod., p. 715 : 1830). The name of *Ceraxys*, which dates from the year 1835, could be used for the European species placed by Schiner under *Meckelia*, the latter name being preoccupied. Macquart originally proposed the name *Ceraxys* to include the two genera *Meliceria* and *Meckelia* of Desvoidy.

Tetanops polita, sp. nov.

Front wrinkled, wholly punctured, not pruinose, yellowish brown, the upper part of the sides dark brown, face, cheeks and lower part of occiput yellowish white, a brown spot on either side of center of face, upper part of occiput polished brown, antennae brown, the first two joints yellowish, proboscis brown, palpi yellowish; body polished black, mesonotum finely punctured; legs brown, the knees and bases of tarsi yellowish, halteres pale yellow; wings grayish hyaline, the base to slightly beyond humeral cross-vein pale brownish, a pale brown crossband nearly fills the first costal cell and extends to the fourth vein slightly beyond base of discal cell. Length, 5.5 mm.

Habitat : Colorado.

Three females. Type No. 4470, U. S. Nat. Museum.

Parcedopa, gen. nov.

Near *Oedopa*, but with the head much narrower. Head, viewed from in front, scarcely broader than high, front only slightly wider than either eye, with rather large punctures, face slightly retreating below, cheeks about half as wide as the eye-height, antennae slightly over half as long as the face, the first two joints very short, the third ellipsoidal, only slightly longer than wide; thorax bearing two pairs of dorso-central bristles and one of acrostichals, one sternopleural but no propleural bristles, scutellum flat above, bearing four marginal bristles; abdomen ovate; first vein of wings bare, hind angle of anal cell prolonged in a lobe which is as long as the cell proper, small cross-vein near middle of discal cell and nearly midway between apices of auxiliary and first veins, third and fourth veins noticeably converging toward their apices. Type, the following species :

***Parædopa punctigera*, sp. nov.**

Head light yellow, the upper part of the occiput, except a triangular spot in the middle of its upper edge, and the upper half of the front black, gray pruinose, a pair of oval, velvet black spots on the front adjoining the eyes at the junction of the yellow with the black, and a round, velvet black dot between but slightly below the insertion of the antennæ, a slender black line extends from near the middle of each side of the face obliquely across the adjoining cheek, and an elongate brown spot at the upper posterior corner of each cheek; antennæ and palpi yellowish, the proboscis black; body opaque, bluish gray pruinose, mesonotum marked with five or seven yellowish vittæ, the median one prolonged across the scutellum, pleura marked with two yellowish vittæ, abdomen tinged with yellow in the middle of the dorsum, segments two to five each marked with a transverse row of four velvet black spots; femora black, gray pruinose, tibiæ yellowish, each marked with a black band near the middle and another toward the tip, tarsi yellowish, the apices brown, wings hyaline, base of costal cell to slightly beyond humeral crossvein brown, stigma brown, its base white, marginal cell marked with four brown spots, two before and two beyond apex of first vein, a brown spot in submarginal cell contiguous to the apex of second vein and a second in extreme apex of this cell extending into the first posterior cell, also a small spot beyond middle of the first posterior cell, small and hind crossveins faintly clouded with brown. Length, 4 to 5 mm.

Habitat: Catalina Springs and Gailuro Mts., Ariz. (Hubbard and Schwarz); and Santa Fe, New Mexico (T. D. A. Cockerell).

One male and two female specimens. Type No. 4471, U. S. Nat. Museum.

***Stictomyia punctata*, sp. nov.**

Head whitish, front densely covered with black dots and with two oval, velvet black spots contiguous to each eye, one opposite the middle of the front, the other opposite the antennæ; face marked with a velvet black spot between the antennæ and with a transversely oval, polished black spot each side of its center, separated by more than its width from the antennæ, sides of face, except next the front, and the cheeks densely covered with black dots, a black streak on occiput near upper corner of each cheek; upper part of occiput, except a transverse yellow streak near the ocelli, opaque black, next the eyes gray pruinose and marked with a row of black dots; antennæ brown, the third joint nearly four times as long as its greatest width; palpi brown, proboscis black; thorax black, gray pruinose, thickly dotted with black, the mesonotum with irregular black vittæ and with an elliptical, raised, polished black spot above each humerus; scutellum black, a median vitta and the sides gray pruinose dotted with black, femora gray pruinose dotted with black, tibiæ black, each with two yellow bands, one before, the other beyond, the middle, tarsi black, the first joint except its apex yellow, base of second joint of high tarsi also yellow; wings pale gray, costal cell and last half of marginal brown, an elongated hyaline spot along first vein near middle of costal cell and two hyaline spots beyond apex of first vein, a grayish brown fascia extends from apex of second vein transversely to fourth vein, preceded by a spot of the same color in the submarginal and another in the first posterior cell; remainder of wing containing several pure hyaline spots, of

where two are in last half of first basal cell, one at each end and three in middle of first posterior cell; broad hind margin of wing nearly pure hyaline. Length, 4 mm.

Habitat: Foot of Little Mt., Mesilla Valley, New Mexico.

A female specimen collected April 10, by Professor T. D. A. Cockerell. Type No. 4472, U. S. Nat. Museum.

Acrosticta fulvipes, sp. nov.

Head reddish yellow, upper part of occiput, except in the middle, black; front grayish pruinose, thickly covered with coarse punctures except on the vertex, middle of face with a metallic, pearly lustre, antennae reddish yellow, the third joint oval, about one-half longer than broad, arista black, the extreme base and a broad band beyond the thickened part, yellowish, palpi reddish yellow, the apices brown, proboscis black; body dark green, opaque, grayish pruinose, the scutellum and metanotum polished; legs reddish yellow, apices of tarsi brown; wings hyaline, the extreme base and costal cell pale brown, the stigma and a spot extending from slightly before apex of second vein to midway between the third and fourth veins, dark brown. Length, 7 mm.

Habitat: Los Angeles Co., Calif.

A female specimen collected by the writer. Type No. 4473, U. S. Nat. Museum.

Euxesta willistoni, nomen nov.

Synonym: *Euxesta spoliata* Williston, North American Fauna, No. 7, page 257; May 31, 1893. *Non* Loew, 1867.

Ortalis basalis Walker belongs to *Euxesta*; Mrs. Annie T. Slosson has collected specimens of this species in southern Florida.

Ortalis diopsides Walker is a synonym of *Scioptera vibrans* Linne.

Cephalia fenestrata, sp. nov.

Reddish yellow, sides of front marked with brown, third antennal joint except its base brown, a brown vitta extends from each humerus nearly to base of wing, then crosses the pleura obliquely to hind coxa; abdomen, except the base and ovipositor, dark brown, apices of tarsi brown; wings gray, the base, costal and marginal cells brown, a whitish hyaline fascia extends from costa a short distance before apex of second vein transversely to slightly below the fourth vein. Length, 7 mm.

Habitat: Onaga, Kansas.

A female specimen collected by Mr. F. F. Crevecoeur. Type No. 4474, U. S. Nat. Museum.

In the table of subfamilies given on page 115 of Williston's manual no mention is made of the subfamily Ortalineæ; a fourth line should be added to couplet 4, as follows:

A sternopleural and a propleural bristle present.....ORTALINÆ.

Epiplatea scutellaris, sp. nov.

Front brownish red, the orbits narrowly white pruinose, face, cheeks and occiput reddish yellow, face in profile straight, slightly retreating below, clypeus invisible, lower side of head horizontal, antennæ yellow, the third joint elongate-ellipsoidal, slightly over twice as long as wide, palpi yellow, proboscis brown; thorax brownish black, scutellum reddish yellow, bearing two bristles, sternopleural bristle present, the propleural wanting; abdomen black, smooth except the last segment, which is scabrous; legs brownish yellow, unarmed; wings hyaline, the base to beyond the humeral crossvein brown, a brown apical spot extending from apex of second vein to the fourth, third and fourth veins almost parallel, hind crossvein very oblique, its upper end nearer base of wing than is the lower, small crossvein scarcely beyond middle of discal cell, outer hind angle of anal cell rounded. Length, 3 mm.

Habitat: Dunsmuir, Calif.

A male specimen collected by Professor H. F. Wickham. Type No. 4519, U. S. Nat. Museum.

Epiplatea gracilis, sp. nov.

Occiput and upper half of front dark green, lower half of front yellow, face polished green, the upper part opaque, white pruinose, a velvet black spot between the antennæ, orbits narrowly yellow, cheeks next the eyes yellow, the remainder dark green, face in profile concave, clypeus distinctly visible, dark green; antennæ yellow, the first two joints black, the third nearly one and one-half times as long as broad, the upper edge concave, the lower front corner produced in the form of a blunt tooth; palpi dark brown, proboscis yellowish brown; body bluish green, rather slender, sternopleural bristle present, the propleural wanting, scutellum bearing four bristles; legs reddish yellow, unarmed; wings grayish hyaline, an apical brown spot beginning at the costa above the hind crossvein and extending slightly converging at their apices, hind crossvein perpendicular, small crossvein near the second third of the discal cell, anal cell rounded at the lower outer angle. Length, 4.5 mm.

Habitat: Allende, Mexico.

A specimen of each sex collected November 23 and 28, by Mr. C. H. T. Townsend. Type No. 4520, U. S. Nat. Museum.

Stenopterina varia, sp. nov.

Head yellow, middle of front brownish, a polished black vitta each side of middle of face, outside of each, and the orbits white pruinose, antennæ yellow, toward the apex brown, palpi yellow, proboscis black; thorax bluish green, the lateral and hind margins, both ends of pleura and the scutellum yellow, the latter bearing six bristles; abdomen green, base of second segment yellow, last segment dark brown; halteres and legs yellow; wings brown, the hind margin, second posterior, and middle of first posterior cell subhyaline, base tinged with yellow, costal cell and an elongated spot on third vein beyond the small crossvein, yellow. Length, 12 mm.

Habitat: Florida.

A male specimen. Type No. 4521, U. S. Nat. Museum.

ON THE LARVÆ OF ATOMACERA AND SOME
OTHER SAW-FLIES.

BY HARRISON G. DYAR.

Atomacera [†]**desmodii**, sp. nov.

Male agrees with Say's description of *A. debilis*, but is smaller, length 2 mm. or less. Four submarginal cells are present: the third joint of antennæ does not taper to tip, but is somewhat thickened on its basal fourth.

Female agrees with Norton's description of *A. ruficollis*, but the thorax above is wholly yellow red, without any black spot and the third joint of antennæ is more thickened. Length 4 mm. Closely allied to *A. ruficollis* Nort., but the third submarginal cell has its bordering veins parallel, while in *ruficollis* they are divergent. Larva, last three stages observed.

Stage.—Head .6 mm. As in the next, translucent yellow, the food green, shining; spinous tubes black walled.

Penultimate stage.—Head .8 mm., pale brown, eyes black. Body as in the last stage, but more yellowish, yellow except for the green food, the tubercles only very faintly shaded; nothing conspicuous but the black-walled tubes in twelve transverse rows which make the larva look shortly spiny. Thoracic feet stumpy, thorax a little widened.

Last stage.—Head round, brownish green, shining, ocellus in a black spot; antennæ rudimentary; width 1 mm. Body somewhat flattened, the subventral region protruding, fluted; feet on joints 6 to 12 and 13, rather slender. Segments with four rounded areas on each side like short tubes on the posterior third of the segment, subdorsal, lateral, stigmatal (posterior) and subventral. These tubes are hollow, colorless, dusky edged, erect, and from the top of each a round drop exudes when the larva is irritated. Before the subdorsal tube on annulet 1 is a tubercle with a seta; another on annulet 2, also before the tube, consisting of two tubercles conjoined or separate; below the subdorsal tube and touching it a large tubercle with one seta; the stigmatal tube arises from the upper edge of a large tubercle with one

[†] Mr. Ashmead's genus *Micrange* is a synonym of *Atomacera*. His statement that the third joint of antennæ is furcate is an error, as no male of *A. ruficollis* is known. *A. debilis* Say is probably the male.

seta; the subventral tube from a large tubercle forming the projection of the subventral ridge on which are several setae; foot with small setae. All the tubercles are shaded with dusky black except in their centers. Segments obscurely 2-annulate, the annulets minutely granular in the center. Body otherwise green, shining, smooth. The glandular tubes form a row on the anterior edge of the cervical shield and on joint 13, fringing the body; the anal plate is smooth.

Cocoon.—Loose, irregular, of yellowish brown somewhat reticular silk. No ultimate stage, the glandular tubes becoming shrunken on spinning.

Food-plant.—Desmodium. Found by Mr. A. Busck and the writer in Alexandria Co., Virginia. Chain Bridge, Va. (Busck); Rosslyn, Va. (Dyar).

***Atomacera ruficollis* Norton.**

No males have been bred, but they will probably prove to be *A. debilis* Say when obtained, as originally suggested by Walsh.

The following notes are taken from the books of the Department of Agriculture (no. 3198) and were written by A. Koebele.

“August 24, 1883, found a small saw-fly larva on *Hibiscus moscheutos* L., sometimes two or three on one leaf. They are about 10 to 12 mm. in length, of a light green color on the upper side and almost white on the under side; head black; a transverse row of short black spines on each segment, longest in front; stigmata black. There is also a variety where the spines are not black, but evidently the same insect. Spun a quadrangular cocoon.”

In the preserved alcoholic material the head is round, prominent, brown black, a space in clypeus and mouth whitish; width 1.1 mm. Antennae rudimentary, not joined. Body with segmentary rows of stout, rather long, black tubes, somewhat longer on the thorax. These are longer than in *A. desmodii*. Anal plate rectangular, dark brown except at tip. Thoracic feet large, the thorax a little enlarged laterally; abdomen smaller, somewhat flattened, its feet small, on joints 6 to 12 and 13. Feet all pale. There are a few minute setae which can hardly be deciphered in the specimens; probably they are as in *A. desmodii*. In the pale variety mentioned above, the head is brown over the vertex, a quadrangular patch in clypeus and eye black. Body tubes colorless. Both species of *Atomacera* rest flat on the venter like slugs, eating the parenchyma of the leaf from below. They are slightly gregarious.

Priophorus irregularis, sp. nov.

Male. Length 4.5 mm.: antennæ long and slender, third joint shorter than fourth, finely pilose, joints 3 to 5 a little expanded at the apices. Face on each side of the ocelli channeled; a flat ridge passing down between antennæ; claws with a tooth at middle. Shining black, palpi, knees and tibiæ whitish except the tip of the middle and hinder tibiæ; first joint of tarsi whitish at base, the rest black. Wings hyaline at tip, the basal three-fourths smoky black. Outer cross nervure of lower under wing cell received at middle of upper cell. One male, Weirs, New Hampshire.

Possibly this is *P. æqualis* Nort. (just as *P. solitaris* Dyar may be *P. simplicicornis* Nort.) but my specimen does not coincide well with the description.

Larvæ, last two stages observed.

Penultimate stage.—Head wider than high, mouth projecting, shining black with a few hairs; width 1 mm. Body of uniform width, rather wider than high, slightly smaller at both extremities; a large, conspicuous, black anal plate. The two rows of low, obscure but rather large watery tubercles bear evident stiff, recurved simple white hairs long on the posterior row, short on the anterior one. Body not distinctly annulated, pale honey yellow, shading into orange on joints 2-3 and 12-13. A row of large, rounded, segmental, subdorsal black spots and a similar smaller subventral row. Abdominal feet on joints 6 to 11 and 13, the feet slightly spreading, not conspicuous from above, pale or blackish tinted.

Last stage.—Head black; width 1.2 mm. Body rather flat, with many white hairs from irregular warts in two transverse rows. Anterior row of hairs moderate, posterior larger and from larger tubercles. The segments are 3-annulate but the anterior annulet bears very few or no hairs. Body whitish, joints 2-3 and 11-12 orange yellow. A row of large black subdorsal spots on joints 2 to 12 over the front row of hairs; anal plate black, large. Warts colorless, transparent. Rarely there are traces of small black dots subventrally. Tracheal line white; feet colorless; hairs all white, recurved. Later the subdorsal dots become very large, the subventral ones distinct or absent, white fat granules appear dorsally except at the vessel. The spots may extend from joints 3 to 13.

Found on smooth willow at Woods Holl, Mass., and Weirs, N. H.; in the latter place there were hundreds of larvæ on one bush which

they had defoliated. Usually only a few on a bush, sitting flat on the venter on the under side of the leaf. The cocoon is spun between leaves. No ultimate stage.

Larva referred to as "N," Can. Ent., XXVII, 340.

Pteronus ostryæ *Marlatt*.

What I consider to be this species occurred to me on *Carpinus Virginiana* in Maryland, but it was not bred. The name has probably been given after the wrong tree.

Stage I.—Eating a hole in the middle of the leaf, the body curled in S-shape. Head smoky testaceous, a dark lateral shade, eye black, shining; width .4 mm. Body translucent whitish, finely annulate, shining, food green; anal segment swollen; feet on joints 6 to 11 and 13, not used.

Stage II.—Head whitish, slightly testaceous, eye black with a shade behind; width .7 mm. Body colorless, the food green, finely annulate; joint 13 enlarged; feet on joints 6 to 11 small; antennæ a rudimentary point.

Stage III.—Head rounded, greenish, shining, a black shade on each side and an elongate one on the vertex; width 1 mm. Body translucent green, the segments about 6 annulate; thoracic feet clear with black marks at the bases; abdominal feet short; joint 13 swollen, with a pair of thick, swollen-tipped clear anal prongs. Neither tracheal line nor dorsal vessel contrasted.

Stage IV.—Head pale brownish green, a black shade behind the ocellus and a linear one on the vertex posteriorly; with 1.3 mm. Segments rather obscurely 6-annulate, translucent green, dorsal vessel not showing at all, tracheal line fine. Feet on joints 6 to 11 distinct, small, joints 12-13 a little enlarged, the bulbous prongs brown at tip. Thoracic feet clear, testaceous at base.

Stage V. has been briefly described JOURN. N. Y. ENT. SOC. V, 26.

Harpiphorus tarsatus *Say*.

A local form of this species occurs on Long Island, N. Y., in which the larvæ differ from the form that I have previously described in possessing the white pruinose coating. This is, doubtless, the true *tarsatus*, as the flies have the hinder tibiæ entirely black as described and not more or less pale on the basal portion as in those bred from the non-pruinose larva.

Several stages observed. At first the larvæ are pruinose with no black marks except the head and anal plate. Gradually these appear.

Last stage.—Head black, mouth yellow, a slight woolly coating. Body yellow subventrally and narrowly on joint 2 anteriorly; dorsally to spiracles whitish with two per segment subdorsal and one large lateral black spot, obscurely connected into a square marking leaving annulets 2 and 4 pale. The subdorsal spots are on annulets 5-6-1 and 3-4; the lateral on 6-1-2. Segments 6-annulate. Anal plate black; joint 13 collared in front; spiracle on annulet 2.

Ultimate stage.—Heads 1.5, 2.0 and 2.3 mm. Very shining and banded. Head jet black; body bright ochre subventrally, on feet and joint 2 anteriorly. Dorsum to spiracles light blue on annulets 2 and 4, on 4 the whole annulet, but on 2 only to the middle of the side. Other annulets, including the collar of joint 13 and the whole of 14 dorsally deep blue black, forming disconnected black parallelograms separated and centered by pale blue.

COMPARISON OF THE LARVÆ OF FOUR FORMS OF *Harpiophorus*.

Name.	Last Stage.	Ultimate Stage.
<i>intermedius</i> Dyar.	No white coating; marked with black varying from a few diffuse spots to heavy black squares; anal plate black.	Heavy black squares on a blue ground, yellow subventrally.
<i>tarsatus</i> Say . .	With white coating; under which are black spottings not fully united into squares; anal plate black.	Heavy black squares on a blue ground, yellow subventrally.
<i>varianus</i> Nort. . .	With white coating; no spots; anal pale black.	Ground color all yellow with slight black spottings.
<i>versicolor</i> Nort. . .	With white coating; no spots; anal plate concolorous with body.	Ground color blue with slight black spottings, yellow subventrally.

Harpiophorus intermedius, var. nov.

Intermediate in coloration between *H. tarsatus* and *H. varianus*, the abdomen being black or nearly so, the hind tibiæ pale red with black apices. The front and middle tibiæ are reddish and the cheeks behind and below the eyes.

Bred from larvæ described as *H. tarsatus*, JOURN. N. Y. ENT. SOC., V, 21.

Harpiphorus testaceus Norton.

There is a published note (Insect Life I, 345) stating that the larva of this species was found on *Polygonum* and *Vitis*. However, on consulting the note books of the Department of Agriculture, I find that the larvæ refused these plants and it is pretty evident that they had been wandering after having defoliated their bush of *Cornus*. These particular larvæ were not bred, but others, stated in the notes to be "identical" were bred, and, though labelled *testaceus* correspond with my specimens of *varianus*. Some preserved larvæ bearing the same number (Dept. Agri., 3543) are also true *varianus*. The true *testaceus* seems not to have been bred as yet.

Schizocerus zabriskiei Ashm.

Leaf miners in Purslane (*Portulaca oleracea*), Bellport, Long Island, New York.

Stage I.—As in the next stage: width of head .25 mm.

Stage II.—Much as in the next stage, the markings faint: head smoky brown: width .35 mm.

Stage III.—The same; width of head .5 mm.

Stage IV.—Head rounded, a little higher than wide, smoky black, the region about the mouth pale; eye black; antennæ rudimentary; width .65 mm. Thoracic feet short, distinct and spreading, marked with black, visible distinctly from the lower side of the mine. Body colorless or faintly yellowish, the food in alimentary canal green; two dark spots on venter of thorax. Segments 3-annulate, with small blackish tubercles on each annulet; one on the first, four on the second reaching to the black spiracle, three on the third and a few on the subventral folds. Abdominal feet very small and short on joints 6 to 11 with also slight lumps that resemble feet on joints 12 and 13 anteriorly. Anal plate transverse, dusky black.

Stage V.—Head colorless, whitish, ocellus black; width .9 mm. Body all green, no marks, flattened; skin appearing granular from the concolorous, obsolete tubercles, the subventral ridge even spinulose. Thoracic feet pale, the abdominal ones obsolete: spiracles black: dorsal vessel dark.

The larvæ mine the leaves of purslane, leaving one leaf when exhausted and starting a fresh mine in another. Pupation in the ground. Several brooded.

A NEW ZYGÆNID FROM ARIZONA.

BY HARRISON G. DYAR.

The subfamily Chalcosinae of the Zygaenidae is represented in America by a single genus, *Gingla* Walk. A species of this genus has occurred in Arizona.

***Gingla laterculæ*, sp. nov.**

A true Zygaenid, the hind wings with eight veins. Palpi short, antennae shortly pectinated, spurs minute. Agrees structurally with the type of *Gingla* in the British Museum, of which Sir G. F. Hampson has sent me the characters.

Female: fore wings red with a narrow outer black border, diffuse inwardly and narrowly produced along costa and internal margin a short distance. Hind wings black, the costal edge somewhat broadly red. Body and appendages black, collar and base of patagia orange: palpi with orange scales. Expanse 21 mm.

Huachuca Mountains, Arizona, July 16-23. Type in the collection of Dr. Wm. Barnes. Cotype in the Natl. Museum, presented by Dr. Barnes. Type no. 4713.

Nearly allied to *G. aequalis* Druce, but smaller, the red color somewhat differently distributed and deeper red, less orange.



NOTES ON LARVÆ OF LEPIDOPTERA.

BY MRS. E. M. SWAINSON.

[These notes were made in Jamaica, B. W. I., by Mrs. Swainson. The moths were determined by Sir G. F. Hampson and the MS. was turned over to me by Professor T. D. A. Cockerell. The selected notes here presented, though brief, refer to species for the most part not previously described, so that any information about them is desirable. All but the last three occur also in the United States.—

HARRISON G. DYAR.]

***Dilophonota obscura* Fab.** A light green larva, just the color of the plant it feeds on with pale yellowish marks down the sides. Length 2 inches.

Pupa in the ground, dark brown with lighter markings.

Food-plant.—Wild wat plant.

Cyenia insulata Walk (*cadaverosa* Grt.). Larva black and hairy, two rows of white spots along the back and one dorsal row. As the caterpillar grows the white spots become much smaller, looking like thin lines. The 1st, 3d, 7th and 9th segments are a dull red, the sides of the 4th are also red, but the color does not extend over the back. On the first and last segments are long white hairs among the fine black ones. Length a little over one inch. The larvæ generally rest on the under side of the leaf and are very fast walkers.

Cocoon composed of hair ; pupa dark brown.

Food-plant.—Jack-in-the-buck.

Callopietria floridensis Guen. Larva velvety dark brown with a subdorsal line of pale cream color ; head reddish brown. When young, soft green with a white line along the sides. Length a little over an inch.

Cocoon among leaves ; pupa brown.

Food-plant.—Fern.

Fruva apicella Grote. A small brown semi-looper. As it grows fine lines of pale yellow appear all over it ; the line above the legs is broader and contains bright orange spots. Head black and white ; thoracic feet black. There are two black bands across the middle of the back, seen plainest when the larva is walking.

Pupa enclosed in a leaf, brown.

Food-plant.—Broom weed, yellow flower.

Remigia latipes Guen. A very dark brown semi-looper with light marks down the face, two velvety black bands on the second and fourth segments respectively, only appearing when the body is bent. Length nearly two inches. The larva has a curious habit of folding itself up when disturbed.

Pupa brown folded in grass.

Food-plant.—Grass.

Gonitis editrix Guen. A semi-looper ; when young pale green, when older a much darker green with a band of white down the sides, with almost black marks and tiny white spots with black dots in the center (probably the tubercles. H. G. D.). Length a little over an inch. When full grown turns to a dull apple green, the black marking much lighter.

Pupa in a leaf, very dark brown.

Thermecia paucula *Walk.* A light green semi-looper, a narrow band of pinkish white along each side, in the center of which is a fine line of pink; a yellowish line between each segment. Tubercles minute, white, with whitish hairs. Head green, shining. When young the larva is entirely light yellowish green.

Pupa chestnut brown.

Food-plant.—Wild creeper growing on rocks.

Hypena obditalis *Walk.* A green semi-looper with a whitish line down each side; a pale yellowish line between each segment. Setæ very fine, black.

Pupa very dark brown.

PRELIMINARY NOTES ON THE LARVÆ OF THE GENUS ARCTIA.

BY HARRISON G. DYAR.*

I think it would be very appropriate if the members of this society should attempt to find out what is still unknown about the life histories of our species of *Arctia* or *Euprepia*, as the genus is now called. It is a specially interesting one as we have a number of closely allied forms, the exact limits of which are still imperfectly known. The larvæ resemble each other closely, yet present some well marked points of difference. As the species are all rather common and so many of them live in our usual collecting grounds, it ought to be comparatively easy to find them and work the matter up. As a preliminary to this work, I will briefly review for you how our knowledge of these larvæ stands at present. You will be able thus to avoid duplication of work, and also to correct the previous work, where it has been erroneous. As some of you may receive eggs of larvæ from correspondents in different states, I will review all the matter that is accessible concerning the North American species. Some of this, gathered from the material in the National Museum and the notes of the Department of Agriculture, has not been published.

*Read before the New York Entomological Society, December 20, 1898.

The last revision of the genus recognizes 23 species. We will consider them under two heads, those inhabiting the Eastern States, and those not found there.

EASTERN SPECIES.

Lining of the medián vein broad.

Veins all lined.

1. *virgo* LINN.
2. *virguncula* KIRB.
3. *nichabo* GRT.
4. *age* DRU.
5. *quensellii* PAYK.

Veins, except the median, not lined.

6. *nais* DRU.
7. *phalerata* HARR.
8. *vittata* FAB. (*decorata* Saund.)

Lining of the median vein linear or absent.

Veins all lined.

9. *intermedia* STR.
10. *parthenica* KIRB.
11. *anna* GRT.
12. *rectilinea* FRENCH.

Veins not lined.

13. *phyllira* DRU.
var. *figurata* DRU.
14. *placencia* SM. & ABB.

1. *Virgo* as moth is a distinct and well marked species. Superficially, smaller specimens resemble *intermedia* or *parthenice*, but are always distinguished by the broad lining of the median vein and the two discal spots of secondaries. *Nichabo* is the nearest ally, but these species have a different facies and are not likely to get mixed together. *Virgo* is abundant, particularly northward, and is a striking species, readily attracting attention; yet our knowledge of the larva is incomplete. The mature larva is black, abdominal feet and subventral warts reddish; hair bristly, black, reddish subventrally and at the anterior end; no markings on the skin. The larvæ hibernate nearly full grown, apparently in the penultimate stage or in the one before that, width of head 2.4 or 3 mm. I think there is only one annual generation and the hibernating larvæ feed up in the Spring to emerge as moths in late July and early August. A number of descriptions of this larva are extant, but are brief and do not cover all the stages. Abbot's figure is much too pale and Stretch describes the larva as having a narrow flesh-colored dorsal line. It remains to be determined whether the larva ever really varies to this extent, and the full life history, including all the larval stages, should be described. The characterization that I give of the larva is taken from the specimens in the National Museum (Dept. Agr. no. 2484) and from some living specimens received from Mr. Doll in the late Fall of 1893.

2. *Virguncula* is also a neatly distinct species not likely to be confused with anything. The absence of the transverse lines and the yellow secondaries give it a very characteristic look. About the larva very little is known. The moth flies early; I have not taken any after the middle of June and I presume the larva must hibernate full grown. I have not had the larva, nor has it been bred at the Department of Agriculture. A brief description has been published by Mr. Coquillett, but I cannot gather from the description anything that will distinguish the larva from that of *virgo*. Practically everything is still to be learned about this species.

3. *Michabo* is a peculiar form, in markings close to *virgo*, but in color so near *arge* that the two are liable to be confused, and have been so in some collections. It is a simpler form than *arge*, the bands retaining their usual shape, only the inner one being occasionally somewhat tooth-like. The species ranges throughout the Atlantic States like the preceding, but it is commoner southward. I have no dates of flight, except one record of emergence of a moth from Florida on April 15th. The larva doubtless hibernates full grown. No description is extant: but fortunately I have a blown larva before me from the Riley collection as well as cast skins from the Department of Agriculture and some notes (Dept. Agr. no. 2588). The larva is grayish black, head black, the body rather grayish brown, with a broad, distinct, straight, cream-colored dorsal stripe. Hair rather long and, though coarse, somewhat soft and brownish. Spiracles white. The notes add a more or less interrupted white subdorsal line, but it does not show in the blown or alcoholic specimens nor in the cast skins. The larva is a close ally of *arge*, but differs in the absence (or reduction) of the subdorsal lines. The full life history is needed.

4. *Arge* is probably our best known species. The moth is peculiar and distinct with its broad vein linings, tooth-like bands and pale pink coloration. It is double brooded, the moths flying in May and July-August. The full grown larva is not infrequently met with late in Fall or in warm days in Winter, having emerged from hibernation. It is grayish black with dorsal and subdorsal lines alike broad, distinct, cream-color, and a broken, waved subventral line; the warts grayish, the hair rather long, coarse, but not bristly, brownish or gray. There are eighteen descriptions of this larva extant and I have notes on all the seven stages* of the first brood, taken from larvæ that Dr. Seifer

* Width of head .3, .4, .65, 1.1, 1.4, 2.0, 2.5 mm. (♀).

kindly furnished me with in 1897. In the first stage the larva has simple setæ, except on wart iii on joints 5 to 13 which bears two hairs, no subprimary setæ. The mature markings are outlined in stage II when the warts appear, and the successive moults disclose no striking differences. I find the moths mate readily in the mating cage, the male flying in during the night.

It might be well to determine the number of larval stages under varying conditions, and especially of the second or hibernating brood, always giving the width of head for each stage. Otherwise the larvæ are fairly well known.

Department of Agriculture numbers are 728P, 1045, 2451, 4117, 4119 and 5865.

5. *Quensellii* is strictly an arctic species. It occurs in the cold parts of both Europe and America, our nearest points being the summits of the White Mountains of New Hampshire. The moth has the usual melanotic and blurred appearance of arctic forms and the lining of the veins varies considerably, so that, in my seven specimens, I cannot always say that the median vein is broadly lined. However, the species is distinct enough in appearance from all other common forms.

The larva is known from European material; Hoffman figures it black with pale dorsal line, the subventral hairs reddish. The only American description is one by Dr. Packard of a "supposed" larva of *quensellii*, taken on the summit of Mt. Washington. I have had a larva very like this from the same place, sent me by Mrs. Slosson in 1895; but I failed to breed it. As neither Dr. Packard's larva nor mine correspond with the European *quensellii*, and they are not unlikely to belong to some other species, we must await the result of positive breeding.

Any of the members visiting the summit next season would do well to search for *quensellii*. It has been noted in Europe that the moth appears only in every other year.* The same may be the case with us.

6. *Nais* is on debatable ground. This and the two following species are doubtfully distinct and often confused. It is not certain whether we have three, two, or but one species. The matter is further confused by wrong determinations and the larvæ also are much mixed as I shall proceed to show. I have before me 50 moths that I

* Sandberg, Ent. Tidsk., IV, 16.

attribute to *nais*, 20 each of *phalerata* and *vittata* (*decorata*). The *nais* vary much in the degree of obsolescence of the bands and in the color of the hind wings; but they all agree in having the costal edge of primaries narrowly black. The species is double brooded, flying in June and August.

Concerning the larva, I can find no description that can be reliably referred to this form. I have, however, a blown specimen from the Kiley collection (no. 333) and notes from the Department of Agriculture (no. 2582) with the moths correctly associated. The larva is brownish black or brown with a very faint, narrow, whitish, dorsal line, not at all contrasted. The hairs are short, stiff, grayish black, reddish subventrally.

Professor French describes the life-history (six stages), but his determination of the moth is doubtful. One specimen seems to have been *phalerata* and of the other the determining character is not given.

The full grown larva may be taken early in Spring, hibernating under stones. It is a common species, and ought to be fully worked out soon.

7. *Phalerata* resembles *nais*, but the costal edge is yellow and there is scarcely any tendency to the obsolescence of the markings. My 20 specimens are very uniform. This does not prove specific distinctness, of course: but I was impressed with the fact that a gap seemed to exist between this form and *nais* at the time that I was collecting both forms at Poughkeepsie, N. Y. I have taken *phalerata* in August, and have a date of issue, March 30th (Dept. Agric. 2580), making it double brooded with hibernation as mature larva, as in *nais*. Concerning the larva, Professor French's description, seemingly referable here, gives it a dorsal nankeen yellow line, expanded somewhat in the middle of each joint. This would be quite distinct from the other forms; but the notes of the Department of Agriculture, of which I have the moth before me, an undoubted *phalerata*, are different. They give a black larva resembling *virgo*, but the warts not polished; no dorsal line is mentioned.

The members ought to settle this contradiction and work out the full life history of this interesting form.

8. *Vittata* (*decorata*) is closely allied to *phalerata*. The costal edge is likewise yellow, but there is a great tendency to melanism; the W-mark is lost in all the females and rarely complete even in the males. The hind wings vary from yellow to red, but tend to a very broad outer black border. The abdomen, too, is often largely black.

The species is a trifle larger than the two preceding. The appearance of my 20 specimens is quite different from *phalerata*, but yet I have no strong character to separate them by. Professor French's description of the larva makes it black without a dorsal line. I have three alcoholic larvæ (Dept. Agr. 2587 and Riley coll. 1261) as well as descriptions (Dept. Agr. nos. 2544, 2581 and 2587). The bred moths are *vittata*, but not all perfectly typical as in none of them, except no. 2544, is the abdomen broadly black. The larva of the typical *vittata* (no. 2544) is said to be black, body olive, the warts black and rough; hair brown, lighter in front; spiracles orange. This agrees with Professor French. The others are the same; but in no. 2581 "an indistinct pale orange dorsal line" is mentioned and one of the alcoholic no. 2587 has a distinct, broad, broken white dorsal line. Of course these larvæ may have been mixed; but the matter is not decided beyond question as to whether *phalerata* or *vittata* has the larva with the dorsal stripes, or whether this is a specific character at all.

I believe some of the members are more familiar with these forms than I am, and I hope they will put their notes together for publication. Much evidence from many sources is needed in this connection.

9. *Intermedia* is often confused with *virgo*, but as I have shown you already, quite unnecessarily so. The moth inhabits the Atlantic states, but has a southern range. Specimens occur in New York, but I do not think it is common here or extends much farther north. It is simply an enlarged edition of *parthenice*, which replaces it in the north, the transverse bands more distinct and more frequently traversing the submedian bar. There are absolutely no firm characters between this and *parthenice*; but the life history is entirely unknown, and it may be found to furnish some further points of difference. I recommend this species to your attention, as any information on the early stages will be worthy of note.

10. *Parthenice* is fairly common in the northern Atlantic states, northern New York, New Hampshire and Maine to Wisconsin: southward it is replaced by *intermedia*. The moth flies in August, somewhat later than *virgo*, with which it is usually associated. I think there is only one annual generation. The species is allied to *intermedia*, as I have shown; but it is also very near to *rectilinea*. The veins are a little more heavily lined than in *rectilinea* with no tendency to obsolescence, and the bands are more or less bent, not rigid. The color of the hind wings, too, is a little more orange-red. Again

parthenice comes very near *anna*. In fact, it has been suggested that *anna* was only a form of *parthenice*. *Anna* has yellow hind wings and a much greater tendency to melanism; but the pattern of the fore wings is almost identical. Thus *parthenice* is a central form with close allies on all sides, leading through *rectilinea* to *phyllira* and the group without linings on the veins, and through *anna* to *ornata* and the western species.

The larva has been described by Saunders as black, with a flesh-colored dorsal stripe and yellowish warts and feet; but this was many years ago, and the observation has not been verified. Larvæ, which I have had from eggs of *parthenice*, did not agree with this description, but were almost absolutely indistinguishable from those of *virgo*. They were, however, much smaller and hibernated in the fourth or fifth stage, less than half grown; width of head .9 or 1.25 mm. I have not seen the mature larva, and it is possible that it may agree with Saunders' description, though I fear that this is unlikely, as it is not customary for the dorsal line to reappear after it is once lost. The process is usually the reverse.

11. *Anna* is really the variety, being the rarer and aberrant form of *persephone*; but the name was published earlier. The secondaries are yellow with a strong tendency to melanism. In my 12 specimens, none have the outer black border broken through, and one has the wings wholly black. The fore wings are like *parthenice*, but the longitudinal bands are occasionally very heavy and the submedian stripe usually runs closer to the median vein. The species is, undoubtedly a good one, though very near to *parthenice*. It inhabits the dry oak woods of Long Island and New Jersey, extending well south, but also into northern New York, Missouri, Nebraska, Iowa and Wisconsin. It is never very common, though well distributed in its wide range. The moths appear in June, and I think there is but one annual generation. The larva is entirely deep black, with shining warts and stiff black hairs, alike in color throughout. I have described the life history up to hibernation (*Psyche*, viii, 53) which seems to occur in the last larval stage. This point is not certain, and hibernated larvæ should be looked for in April or May, and the heads measured to determine whether there is any moult in the Spring.

12. *Oithona* (*rectilinea*)* is a puzzling form. We naturally

* *Oithona* Streck. is an aberrant form of *rectilinea* French, as I learn from an examination of Dr. Strecker's type.

associate it with the species with the veins lined, yet, except for this character, it is absolutely the same as *phyllira*. In fact, several of my old specimens are labelled *phyllira*, and this is probably the reason that the form was left undescribed by the early authors. Now, the character of the linings of the veins is not fixed in this case, as it usually is. I have two specimens in which the linings do not attain the outer margin; others in which only the subcostal, median and internal veins are lined on basal portion, in fact true intergrades to *phyllira*. I feel quite certain that *rectilinea* is only a form of *phyllira*: just the same relation between them as between the western *ornata* and *achaia*: but to clinch the argument, we must do some breeding to get either form from the other. I trust the opportunity will arise to some of us.

The larva has not been described and none of my 22 specimens are bred. The range is all over the eastern part of the country, New York, New Hampshire, Illinois, Missouri and Mississippi.

13. *Phyllira* is again a central form around which clusters much uncertainty. My ten specimens do not vary much. There is in some a trace of lining on the median vein, completing the links with *rectilinea*, and in a few the bands are somewhat broken up and abbreviated; but it is the inner bands that are affected first and the W-mark remains the most distinct. The secondaries are very uniform with the narrow black edge, three submarginal spots and small discal spot, the latter sometimes absent. The species is southern in its range. I have nothing north of Maryland and most of my specimens are from Florida. This is surprising if we have to do with an alternative form of *rectilinea*: but may be due to the smallness of the collection, as *phyllira* is not often taken now. Or else it may be due to climatic causes.

The larva was figured by Abbot and Smith in 1797. There are no descriptions since. I have, however, blown specimens from the Department of Agriculture (no. 2494) and they agree sufficiently with Abbot's figure. The insect is brown-black, mottled, with shining dorsal warts and a distinct, pale yellow dorsal line that widens almost to spots in the center of each segment and is narrowed, or even broken in the incisures. The hair is short, black and bristly, grayish sub-ventrally.

Most of the details of the life history remain to be determined.

Celia Saunders (*franconia* Hy. Edw.) has been made a synonym of this species. It differs in the yellow secondaries with a strong ten-

dency to melanism, confluent basal spots being present. The range is northern. I have a specimen from northern New York and I know of no southern records; but my material is extremely limited. Saunders describes the larva as brownish black, the hair black, brownish sub-ventrally and at the ends, abdominal feet yellowish. No dorsal line is mentioned and the larva would appear very distinct from *phyllira*. It needs thorough investigation.

Figurata (*f-pallida* Streck., *excelsa* Neum.) has been made a variety of *phyllira*. It is a melanotic form, but the melanism affects first the outer borders of the wings, so that the W-mark is absent even when the other lines are bright and distinct and the secondaries have an even black border. The hind wings are either red or yellow. It is a southern form and is but rarely taken. It reaches southern New York where Mr. Graef collected a female and by fortunate breeding secured a number of examples. I have also from Staten Island larvæ labelled *figurata* (Dept. Agr., no. 2552); but none of the moths are before me so that I cannot verify the determination.

Mr. Graef describes the larva as black, mentioning no marks. My blown larvæ agree, but the hairs are a little brownish, and there is a very faint, straight, whitish dorsal line, broken or continuous, easily overlooked on cursory examination. In one of four alcoholic specimens the line comes out very heavy and distinct; but of course there may have been a mixture of species.

I see no essential difference between the larvæ of *celia* and *figurata*; but the considerable difference of *phyllira* shows that the whole matter of synonymy as well as the life histories of the forms needs to be studied further.

14. *Placuntia* is a peculiar and distinct form inhabiting the South. The records are Georgia, Florida, Kansas and Texas. It may range further north. Indeed I should expect it would be found as far as Long Island in open, sandy districts; but this may not be the case. The fore wings are black, diversified by only a few pale dots, rarely indicating the usual lines, but always broken up. The hind wings are much as in *figurata*. I found the species at Miami, Florida, in the sandy pine barren and got the larva as far as stage III. The first stage was as usual in the genus, single hairs, except wart iii on joints 5 to 13, which bears two hairs; no subprimary setæ. In stage III the color was blackish without lines, the hair black, short and gray sub-ventrally. Abbot and Smith's figure of the full grown larva is gray,

the dorsal stripe red, yellowish and broken in the incisures; head and hair black. There has been no verification of this figure; and larvæ that I got in Florida, which I thought were *placenticia*, were quite different. However I did not breed them, and the matter is still open.

WESTERN SPECIES.

Abdomen as usual with a row of dots or a band.

Moderate sized species.

15. *ornata* PACK.
16. *obliterata* STR.
17. *nevadensis* G. & R.
18. *superba* STR.
19. *williamsii* DODGE.
20. *favorita* NEUM.

Small species.

21. *convinoides* STRECK.
22. *blakei* GRT.

Abdomen nearly immaculate with a heavy black tip.

23. *proxima* GUER. (*docta* Walk., *antholca* Bd.)

15. *Ornata* has two forms, very distinct at first sight, but intergrading. The typical *ornata* is without linings on the veins, and occurs sparingly in the southern part of the range of that species. I have it from San Francisco, Lake county and Mariposa county, California. The species as a whole ranges along the west coast from California to British Columbia. I do not know the exact limits of distribution. The variety *complicata* is dominant in Portland, Oregon. This species is the western representative of *anna*, from which it differs in the greater number of bands on the forewings and the tendency to orange of the hind wings. The spotting of the latter also runs somewhat differently. In the occasional disappearance of the vein linings, it resembles *oithona-phyllira* as already noted.

The larva (form *achiaia*) has been described by Stretch, who makes it black with a double, somewhat waved, dull reddish dorsal line; feet flesh color; hair light brown, soft and silky. My larvæ (from *ornata*, Psyche, vi, 380*) were finally black with the subventral hairs reddish and no lines. They did not reach maturity, and I do not know whether they would have appeared like Stretch's or not; I think not.

This species will have to be gone over again; perhaps more than once.

*I described these as *blakei* (*nevadensis*), mistaking the female *ornata* for a moth of the group without the vein linings. Subsequent specimens from the same locality give the hint as to what the species really was.

16. *Obliterata* is only a name, and the species, if species it be, is not known beyond Stretch's description. As far as this description goes, it suggests a *quensellii* with red wings; but I do not know if such a thing ever occurs.

17. *Nevadensis* is one of the forms that inhabit the arid region from southern California and Arizona, through Colorado and Nevada to eastern Washington and Montana. You may have thought that the eastern species were in some confusion, but they are quite plain in comparison with the confusion that exists here. Whether there are half a dozen species, or only one, I am unable to say; but I will treat them as in the last revision, making four species. *Nevadensis* with its forms *incorrupta* and *nevadensis* is the most abundant. The veins are unlined, but the transverse maculation is fully present, four bands beside the W-mark. In one form the bands are rather narrow, in the other (*incorrupta*) broad. *Nevadensis* has the thorax black. It looks very distinct, and I have no intergrades; but it occurs with the wings of both the narrow and broad banded forms and scattered all over the same regions. Besides Dr. Strecker has specimens with the black thorax and without it, said to have been bred from the same brood. Mr. Coquillett has had the larva of *nevadensis* (black thorax) in southern California and tells me that it is black with a broken dull white dorsal line; the hair brown.* This is essentially the same as that of *superba*, the next species. Nothing is known of the early stages of the forms without the black thorax.

18. *Superba* was separated from *nevadensis* as the secondaries seemed redder. This character is not at all marked, and otherwise

* *Arctia nevadensis* Grote.

Larva. Body black, with a purplish tinge, the portion below the spiracle lighter, more grayish, a broken, dull white dorsal line; warts light gray, hairs issuing from them in spreading clusters, not concealing the ground color, mixed black and reddish or black and yellowish, the red and yellow hairs most numerous in the middle of the dorsum and low down on each side of the body and varying in color from a bright brick red to a pale straw yellow; spiracles yellowish brown, ringed with black; head black, the sulcus on top between the two lobes, usually the sides and lower margin of the clypeus, and a dot at the base of each antenna, yellow; mouthparts marked with yellow anal and abdominal prolegs largely pale yellowish; length, 36 mm. Found a great many from half to nearly full grown feeding upon various plants at Santa Monica, Calif., March 14, 1891. Placed leaves of *Malva borealis* in their cage, and they fed greedily upon them. One moth issued July 20th; at this date two were chrysalids and ten were larvae. The remaining moths issued in August and September.

D. W. COQUILLETT.

the markings are the same, except that the lines are more broken up. The form comes from the rainy coast region of the Northwest. We have specimens from Easton, Washington, with a blown larva. This is black, dotted with pale, a white dorsal line broken into three small spots on each segment; hair mostly brown, even well up on the back, short, bristly.

Gencura Streck. is referred here as a synonym, but it has the full banding, the bands rather narrow, and differs from the *nevadensis* form in that the secondaries have larger spottings. The thorax is lined. It comes from Colorado.

19. *Williamsii* is again the variety with *determinata* Neum. as the stem form, but the varietal name has priority. The form is distributed with *nevadensis*, but mostly in the higher altitudes or northern parts of its range. The black color of the wings has turned to a faded brown, except centrally, and the transverse bands are reduced, beginning at the base, to two, or but one, beside the W-mark. The secondaries are often considerably blackened. This may be the high altitude *nevadensis*, just as *superba* may be the rainy region form of the same species. The larvæ are not known.

20. *Favorita* is a curious blurred form; otherwise it is nothing but *phyllira*. I suspect that this is only *phyllira* migrated to the Rocky Mountain region. I have seen very similar specimens from Grand Rapids, Michigan. The larva is not known.

21. *Cervinoides* is not known to me by any specimens other than Strecker's types. It is a high altitude form, coming from Colorado. Professor Smith says "this will prove an undersized *phyllira* with black secondaries," but he might as well have said an undersized *williamsii* or a race of *quenselii*, since to modify *phyllira* in this way would be to make another species of it. I suspect that this form is Dr. Packard's "*quenselii*" of the Hayden Reports. It is in any case a form modified by cold; but its relations must be left till further investigations. The larva is not known.

22. *Blakei* (*bolanderi*)* is a small species with brown (not black) fore wings and yellow hind wings, marked like *determinata*, or with even more bands. It comes from the arid region and is probably widely spread in the colder parts of this region. The type of

*After examining Grote and Robinson's type in the Academy of Nat. Sciences at Philadelphia, I find *blakei* is what I had previously called *bolanderi* and not *nevadensis*.

bolanderi was taken at Mt. Shasta, California; but my specimens, agreeing very well, are from Montana. The larva is quite distinct. Black, dorsal band vermilion red, pale in the incisures; segments white dotted posteriorly; wart iii bright red at base, the subventral warts pale. Hair stiff, reddish subventrally. I have given the full life history in Proceedings of the Boston Society of Natural History, Vol. XXVI, page 153 (1893).

23. *Proxima* is a distinct form inhabiting the arid region. I have taken it at Salt Lake City and it is very abundant in southern California. The sexes are quite dissimilar in appearance, on account of the different color of the hind wings. The species extends into Mexico. I would request collectors not to present specimens of this species to the National Museum, as we have them already by the drawer full.

The larva is black with a series of dorsal red spots, one on a segment, each pointed before; the hair is black, mixed with brown. I have described the life history (Ent. Amer., VI, 117) and the National Museum has a dozen blown larvæ prepared by Mr. Koebele at Los Angeles, California, and Ogden, Utah. It will not be necessary for you to waste much time on this common species; but if eggs come to hand, fuller observations may be made on stage I than I was able to make at the time I bred the species.

Finally I would call your attention to a few structural points that will assist in separating the larvæ of *Euprepia*. As these are not generally given in descriptions I have been unable to use them, except in the few larvæ that are actually before me. These points relate to the size of wart i, the presence or absence of a shining base to wart ii and the distinctness of the barbules of the hairs. Eight species that are before me separate as follows, which will illustrate the way in which I suggest that these characters be used.

Partial synoptic table of larvæ of Euprepia.

Wart i large, about half the size of wart ii; wart ii with shining base.	
Hairs barbuled, distinctly cleft under the lens.	
No dorsal line.	
Hair partly red.....	virgo.
Hair all black.....	anna.
A broken white dorsal line.....	superba.
Hairs smoother, only the shorter ones distinctly cleft.....	proxima.
Wart i smaller, about one-third the size of wart ii; wart ii with shining base.	

Warts all small, hair short.....	phyllira.
Wart i small, about one-fourth the size of wart ii; wart ii without shining base.	
Hairs without distinct barbules.	
No dorsal line.....	nais.
Dorsal line distinct, subdorsal broken.....	michabo.
Dorsal and subdorsal lines distinct, subventral broken.....	arge.

ADDITIONAL NOTES ON TRYPETIDÆ.

BY R. W. DOANE.

It is with a good deal of hesitancy that I dare to take issue with so eminent authority on Diptera as Mr. Coquillett. But since his recent paper on Trypetidæ (JOUR. N. Y. ENTO. SOC., Vol. 7, no. 4) appeared I have been asked to say what I thought of the synonymy as therein set forth. As the paper shows evidence of having been hastily thrown together and as I still have before me all the types described in Vol. 7, no. 2 of the same journal it may not be amiss to call attention to some of the points in the original descriptions that seem to have been entirely overlooked and perhaps add a few notes.

Spilographa setosa Doane differs from *S. flavonotata* in the following particulars.—No trace of lighter markings on thorax; dark instead of pale bristles on hind tibiæ; posterior femora with brownish bristles near tip; more brown on basal portion of the wing; bristles on the third vein extending beyond the anterior cross vein.

Trypeta straminea Doane differs from *T. occidentalis* Snow in the following particulars.—Very much smaller, only about half as large; dark reddish yellow instead of lighter yellow; pile on thorax and abdomen not so long or dense; wings comparatively narrower. Every one of these characters is constant throughout a large series of both species. They can not possibly be confused.

Eurosta conspurcata Doane differs from *E. reticulata* Snow in the following particulars.—Smaller; thorax lighter brown; no light stripe on abdomen; the ring is much longer in proportion to its breadth; the hyaline spots are larger and somewhat differently arranged especially in the posterior portion of the wing, and there are not so many small yellow spots. I have only a single male specimen of this species but it is perfect and well preserved and looks so wholly unlike any of

the specimens of *E. reticulata* that I have before me that I cannot but believe it to be a distinct species.

Eutreta nora Doane differs from Loew's description of *Tephritis platyptera* in the following particulars.—Front not narrowed anteriorly, equals much more than half the width of the head; abdomen dark velvety brown with a narrow median longitudinal grayish line, but with no black spots; third vein with bristles. Lowe's description was drawn from a single badly preserved specimen, so of course there is a possibility of it not being accurate but as it stands it does not describe the specimen now before me.

Tephritis californica Doane and *Urellia pacifica* Doane.—This of course is the worst blunder of the whole lot. To declare that two forms belong to the same species when they are so wholly unlike as to leave little doubt that they even belonged to different genera is carrying things a little too far. Indeed the differences are so great that to point them out would simply mean to rewrite the description of each one. So I refer to the original description. If they cannot be understood look at the pictures of the wings. There is no possibility of them being confused. Neither of them corresponds at all with the description of *Euaresia araneosa* Coq., and as it is evident that the description of *T. californica* and *U. pacifica* have not been closely studied when they were declared to be synonyms of this species it is not worth while again going into detail. Again I refer to the original description.

As to the true generic position of several of these forms I expressed myself as being in some doubt as all generic tables given heretofore were based almost entirely upon the wing markings and I did not have the original descriptions of all the genera before me. When, however, I could not determine by the wing markings to which of two genera any form belonged I studied the general characters of the body and placed it in the genus to which it seemed the most closely related. I believe by this method I came nearer indicating their true relationship than can be done by simply studying the wing markings alone.

PROCEEDINGS OF THE NEW YORK ENTOMOLOGICAL SOCIETY.

MEETING OF NOVEMBER 15, 1898.

Held at the American Museum of Natural History.

President Love in the chair. Eight members present.

Mr. Chas. Wunder was elected an active member of the society.

Mrs. Browning proposed Mrs. A. L. Leshner for active membership.

Mr. Kemp exhibited an electric lamp for night collections and spoke on the merits of the same. Mr. Daecke exhibited an acetylene (calcium carbide) lamp.

MEETING OF DECEMBER 6, 1898.

Held at the American Museum of Natural History.

President Love in the chair. Seven members present.

Mrs. Leshner was elected a member of the society. Mr. Beutenmüller proposed Mr. H. S. Barber for active membership.

On motion the President appointed Messrs. Zabriskie, Beutenmüller and Blackburn to serve on a committee for nominating officers for 1899. The sum of \$25.00 was appropriated for the purpose of purchasing a lantern for the society.

Dr. Love announced that an auction sale of insects for the benefit of the JOURNAL would be held on December 13th at 8 p. m. and that the list of insects for sale had been distributed.

Dr. Love exhibited a male of *Cossus macmurtriei*.

MEETING OF DECEMBER 13, 1898.

A special meeting was held at 417 Madison Avenue, for the auction sale of insects. The sum of \$107.36 was realized.

MEETING OF DECEMBER 26, 1898.

Held at the American Museum of Natural History.

President Love in the chair. Eight members present.

Mr. Barber was elected a member of the society.

Mr. Beutenmüller acted as Recording Secretary *pro tem.* in absence of Mr. Daecke.

Mr. Dyar read a lengthy paper on the larvæ of Arctiidae (see ante, p. 34).

After discussion, adjournment.

MEETING OF JANUARY 3, 1899.

Held at the American Museum of Natural History.

President Love in the chair. Eight members present.

The following officers for the year 1899 were elected. President, E. G. Love; Vice-President, C. F. Groth; Rec. Secretary, C. Schaeffer; Corr. Secretary, E. Shoemaker; Executive Committee, J. L. Zabriskie, C. Palm, H. Hug, R. Ottolengui; Publication Committee, Wm. Beutenmüller, L. H. Joutel, C. F. Groth, C. Schaeffer.

MEETING OF JANUARY 17, 1899.

Held at the American Museum of Natural History.

President Love in the chair. Ten members present. The President made the following appointments: Auditing Committee, Messrs. Palm, Hug and Munch; Field Committee, Messrs. Davis and Blackburn; Delegates to the Scientific Alliance, Messrs. Beutenmüller and Groth.

Mr. Schaeffer gave a brief review of the species of *Oxyporus*. He pointed out the distinguishing characters and variations, illustrated by a series of specimens. He also exhibited specimens of *Bruchus brasiliensis*, said to have been taken in Astoria, Long Island, N. Y., but doubted the correctness of the locality, and veracity of the collector.

Mr. Beutenmüller exhibited a new *Thecla* from Texas, allied to *autolycus* and proposed the name *Thecla ilavina* for it (see Vol. VII, p. 254). He also exhibited a large series of the recently described *Melitæa maria* from Utah, and the types of *Sesia tacoma*, *S. arizone* and *Pyrrehotenia coccinea*. He stated that the latter species undoubtedly belonged to a new genus.

Mr. Groth read a paper on the 17-year Cicada, by Mr. Benjamin Lander (see Vol. VII, p. 212).

After discussion, adjournment.

MEETING OF FEBRUARY 7, 1899.

Held at the American Museum of Natural History.

President Love in the chair. Eight members present.

Dr. Love spoke of the anatomy of insects, illustrated by a series of lantern slides, showing dissections of various kinds of species.

MEETING OF FEBRUARY 21, 1899.

Held at the American Museum of Natural History.

President Love in the chair. Eight members present.

Mr. Palm exhibited some rare Coleoptera taken by Dr. Kunze in Arizona amongst which were *Cychrus snowi*, *Pachyteles testaceus*, *Tetragonoderes pallidus*, *Trogodendron edwardsii*, *Aulicus nero*, *Chalcolepidius tartaricus*, *C. behrensii* and *C. smaragdinus*, *Plusiotes gloriosa*, *P. lecontei*, *Xyloryctes faunus*, *Dynastes grantii*, *Acoma brunnea*, and many other species.

After discussion, adjournment.

JOURNAL
OF THE
New York Entomological Society.

Vol. VIII.

JUNE, 1900.

No. 2.

REVIEW OF THE AMERICAN CORYLOPHIDÆ,
CRYPTOPHAGIDÆ, TRITOMIDÆ AND DER-
MESTIDÆ, WITH OTHER STUDIES.

BY THOS. L. CASEY.

The following pages record the results of a number of studies made at various times during the year just coming to an end, and may possibly be of some service to collectors in arranging their cabinets. The descriptions give only the salient characters of each species, and, in a genus such as the corylophid *Gronovus* for example, wherein the species mutually resemble each other very closely, can be appropriately limited to the few apparent differential characters. Further elaboration in such cases would prove to be largely repetition, and serve no really useful purpose in the present preliminary outline sketches, which are only intended to partially and imperfectly point the way.

FORT MONROE, VA., December 14, 1899.

HYDROPHILIDÆ.

Limnebius Leach.

The minute species composing this genus have the body elongate-oval and convex, the very small sparse punctures of the upper surface bearing each a fine decumbent hair. The labrum is transverse, with the apex sinuate at the middle. The inferior part of the eye is well developed and prominent, with the individual facets convex, but the superior part is not more convex than the frontal surface, with the facets larger and perfectly flat. The antennæ are partially received in repose in a very narrow groove between the eyes and the buccal opening, and, curving around the lower contour of the eyes, the club is

Alutaceus is the largest species, being fully 1.6 mm. in length, and *coniciventris* the smallest. The latter greatly resembles a species from South Africa, taken some years ago by the writer. *Piceus* is very abundant in the coast regions from Monterey northward, and the female described by me as *politus* does not seem to differ: it is the only species before me which is represented by both sexes. Individual examples vary but little among themselves in point of size.

STAPHYLINIDÆ.

The genus *Homœusa* of Kraatz, represents an isolated group of the subtribe Aliocharina, containing a number of genera for the most part monotypic as far as known. Those before me may be characterized as follows:—

- Antennæ 11-jointed.....2
 Antennæ 10-jointed.....4
 2—Prothorax broadly and evenly rounded at the sides, the apical angles rounded....3
 Prothorax broadly angulate at the sides at the middle, the angle rounded, the apical angles obtuse but not rounded, the base arcuate, not sensibly sinuate toward the angles, which are obtuse but not rounded; two basal tergites broadly, equally and deeply impressed in about basal half; fine elevated anterior bounding line of the metasternum strongly and narrowly arcuate anteriorly at the middle, the mesosternal process long and finely acuminate, extending to almost opposite the apices of the coxæ; infraorbital elevated line of the head feeble and obtuse; antennæ very strongly incrassate; basal joint of the hind tarsi distinctly shorter than the next two combined; [type *crassicornis* Csy.].....**Myrmobiota** Csy.
 3—Base of the prothorax transverse and broadly bisinuate, the basal angles nearly right and not at all rounded; two basal tergites narrowly, deeply and rather abruptly impressed along the basal margin; antennæ moderately incrassate; anterior marginal line of the metasternum transverse and only just visibly and very broadly arcuate anteriorly at the middle, the mesosternal process as in *Myrmobiota*; head with the infraorbital ridge very fine, and, between it and the eye, having two additional broad feeble and parallel ridges; basal joint of the hind tarsi fully as long as the next two combined; [type *acuminata* Märk.].

Homœusa Krtz.

- Base of the prothorax arcuate, becoming feebly sinuate near each angle, the latter slightly obtuse and distinctly, though narrowly, rounded; basal tergites not impressed at base; antennæ feebly incrassate, the last joint longer than the two preceding combined and somewhat compressed apically; mesosternal process angulate, much shorter than in the two preceding, the metasternal line obscured in the type; infraorbital ridge fine but distinct, the additional ridges of *Homœusa* wanting; basal joint of the hind tarsi distinctly shorter than the next two combined; pubescence longer and more conspicuous; [type *arinitula* Csy. infra.].

Soliusa, gen. nov.

- 4—Prothorax as in *Homocusa*, the base transverse and bisinuate, the angles right, not rounded and somewhat prominent, the sides arcuate and apical angles very broadly rounded; basal tergites as in *Soliusa*, not impressed at base; eyes smaller than usual, the antennae rather strongly incrassate, the tenth joint probably formed by the fusion of two, but not relatively longer than in *Homocusa*; infraocular ridge fine but abruptly and strongly elevated, the additional ridges wanting; basal joint of the hind tarsi as long as the last and a little longer than the next two combined; pubescence moderate in length as in *Homocusa*; [type *expansa* Lec.]..... ***Decusa***, gen. nov.

The type of *Soliusa* may be briefly described as follows:—

Moderately stout and depressed, the head nearly three-fifths as wide as the prothorax, with the eyes slightly prominent; antennae but little longer than the width of the body; prothorax three-fourths wider than long, equal in width to the elytra and distinctly shorter, the sides rotundato-convergent anteriorly; abdomen at base nearly as wide as the elytra, acuminate, the sides straight; fifth tergite at apex three-fifths as wide as the first; color throughout pale brown, the abdomen a little darker, the surface rather shining and quite feeble punctulate; pubescence conspicuous but subdecumbent as usual. Length, 1.75 mm.; width 0.63 mm. New York..... ***crinitula***, sp. nov.

Individuals seem to be rare in all of these genera and probably have throughout a more or less complete symbiosis with ants. *Myrmobiota crassicornis* and *Decusa expansa* have both been sent to me by Mr. Wickham as having been discovered in ant-nests.

Mr. Wasmann (Tijd. v. Ent. XLI), states that *Myrmobiota* Csy. (Col. Not. V, p. 594) is identical with *Homocusa* Krtz., citing specimens collected by Mr. Wickham and forwarded to him through Mr. Schmitt. There is manifestly some mistake in identification, however, and my friend's remarks must refer to the species here described



FIG. 1.—Prothorax of *Myrmobiota* and *Homocusa*.

under the name *Soliusa crinitula* or to one closely allied thereto; but if the latter surmise prove to be correct, I am forced to differ in opinion concerning the status of that species, for a study of the basal tergites of the abdomen, form of the mesosternum and thoracic base, and other characters, show that *crinitula*, also, is generically distinct. In regard to *Myrmobiota*, there can be no doubt of its wide isolation from *Homocusa*, as an inspection of the small accompanying diagrams of the prothorax will abundantly demonstrate, the upper figure referring to *Myrmobiota* and the lower to *Homocusa acuminata*. That Mr. Wasmann has fallen into an error in identification, is furthermore evident at once from his statement that *crassicornis* (Wasm. nec

Csy.) differs from *acuminata*, among other minor characters, in having finer and denser pronotal punctuation, while, as a fact, the pronotum is much more coarsely punctured in *crassicornis* Csy. than in *acuminata*.

Chitosa gen. nov.

The type of this genus is *Dinarda nigrita* Rosh., which differs from *Dinarda*, as represented by *märkeli* and *dentata*, very profoundly in antennal and tarsal structure, as well as in the entire form of the prothorax and nature of the sculpture. In *Dinarda dentata* the prothorax is broadly and evenly bisinuate at base, and the sides near the basal angles are parallel and nearly rectilinear, the antennæ cylindrical, becoming somewhat acuminate at tip, and the basal joint of the hind tarsi but little longer than the second, the first four joints in fact diminishing only just visibly and quite regularly in length. In *nigrita*, on the other hand, the base of the prothorax is arcuate, becoming emarginate at each side, and the side margin is emarginate near the basal angles; the antennæ are gradually and strongly incrassate, a form wholly foreign to *Dinarda*, and, finally, the hind tarsi are very remarkable in structure and wholly different from any I have seen elsewhere in the Aleocharini. The basal joint is thicker than the remainder, darker in color or more highly chitinized, cylindrical and longer than the next three joints combined, the latter short, gradually diminishing in length and obliquely truncate at their apices, the fifth as long as the preceding three together and more slender. These characters prove that *Chitosa* is a genus quite isolated from any other; it is however related to *Dinarda*. It occurs in Spain.

SCAPHIDIID.E.

This family seems to be very much better represented in America than in Europe, and a number of new forms have been discovered since my revision (Col. Not., V.).

Scaphidium Oliv.

The species before me seem to be five in number, *piceum* being quite evidently distinct from the maculate forms; they may be defined as follows:—

Elytra black, each with two pale subexternal spots.....	2
Elytra uniform in coloration throughout, with a few discal coarse punctures in short series	4

2—Elytra without large punctures in series at any part of the disk, black, the spots small and flavate, the anterior triangular, not extending inwardly to outer third, the posterior very small, transversely oval, at outer fourth, twice as far from the apex as from the side margin. Length 4.7 mm.; width 2.6 mm. Southern New England to Indiana.....**obliteratum** Lec.

Elytra with coarse punctures in short series toward base and inner two-thirds, black, the spots large and generally rufescent.....3

3—Coarse punctures very few in number, the remainder of the disk with the punctures very sparse and subobsolete; posterior spot transverse and only very feebly sinuate anteriorly. Length 3.8–4.0 mm.; width 2.3 mm. Indiana, Iowa and Kansas.....**quadriguttatum** Say

Coarse punctures numerous and close-set in the series, the general punctuation usually more evident; posterior transverse spot strongly arcuate, its anterior margin deeply sinuate; body slightly smaller and distinctly narrower. Length, 3.8 mm.; width 2.1 mm. Colorado? (Cab. Levetie).....**ornatum**, sp. nov.

4—Body deep black throughout, rather narrowly oval; impressed area of the metasternum in the male sparsely punctate, the fulvous hairs longer. Length 4.0–4.2 mm.; width 2.4–2.5 mm. Rhode Island to Indiana and Iowa.

piceum Melsh.

Body castaneous, more broadly oval, the metasternal area of the male larger, more closely punctured and clothed with shorter hairs; sculpture similar to that of *piceum* and *quadriguttatum*. Length 4.5 mm.; width 2.7 mm. Indiana.

aplum, sp. nov.

In *quadriguttatum* the first two, of the five joints constituting the antennal club, are equal in size and smaller than the last three; in *ornatum*, however, the seventh joint is distinctly larger than the eighth.

Cyparium *Erichs.*

The two species now known to me may be distinguished as follows:—

Broader and somewhat oblong-oval, castaneous in color, the legs paler; antennae pale throughout. Length 3.2–3.3 mm.; width 1.9–2.0 mm. North Carolina. [*substriatum* Reit].....**flavipes** Lec.

Narrower and evenly oval, the body black throughout, the head rufescent and the legs rufo-piceous; antennae pale, the 5-jointed club blackish; eyes rather less widely separated on the front; punctures of the six abbreviated elytral series much smaller. Length 3.5 mm.; width 2.0 mm. Texas (Brownsville).

ater, sp. nov.

The characters given by Reitter to distinguish *substriatum* (Verhand. Nat. Ver. Brünn, XVIII) are completely those of *flavipes*, and the name must therefore be relegated to synonymy.

Bæocera *Erichs.*

The known species of this genus have materially increased in number of late, and those in my cabinet may be arranged as follows:—

- Scutellum not visible behind the basal lobe of the pronotum when the latter is normally adjusted to the base of the hind body.....2
- Scutellum visible though always very minute and transverse.....9
- 2—Basal marginal stria of the elytra entire.....3
- Basal stria either much abbreviated externally or interrupted about the middle of each elytron.....7
- 3—Larger species, 1½ mm. in length or more.....4
- Very small species, scarcely exceeding 1 mm. in length.....6
- 4—Third antennal joint distinctly shorter than the fourth; punctures along the dilated posterior margin of the intermediate acetabula small or moderate in size...5
- Third antennal joint fully as long as the fourth; marginal punctures very coarse; color black throughout, the elytra feebly rufescent at the apical margin and the abdomen paler toward tip; legs dark rufous; upper surface not distinctly punctate at any part. Length 1.6 mm.; width 0.9 mm. Iowa (Keokuk).
- speculifer** *Csy.*
- 5—Body broadly oblong-oval, the third antennal joint as long as the second, black, the elytra picescent posteriorly, very obsoletely punctulate; legs dark rufous. Length 2.0–2.6 mm.; width 1.3–1.75 mm. Pennsylvania, District of Columbia, Illinois, and Iowa**concolor** *Fabr.*
- Body narrowly oval, black throughout, the elytra rather abruptly rufous in apical sixth or seventh; legs dark rufous; elytra sparsely and very obsoletely punctulate; third antennal joint much shorter than the second. Length 1.9–2.2 mm.; width 1.2–1.25 mm. New York (Long Island), North Carolina (Asheville), and Indiana**congener** *Csy.*
- 6—More narrowly oblong-oval, black, the elytra more distinctly rufescent at apex; antennæ shorter, not as long as the width of the body. Length 1.15–1.25 mm.; width 0.7–0.75 mm. Rhode Island (Boston Neck), and Michigan
- apicalis** *Lec.*
- Broadly and evenly elliptical, the median line of the body very much more arcuate in profile, deep black, the elytral apices scarcely paler; antennæ relatively distinctly longer, as long as the width of the body. Length 1.1–1.15 mm.; width 0.7–0.72 mm. Texas (Columbus).....**robustula** *Csy.*
- 7—Marginal line of the prothorax evenly and moderately arcuate when viewed laterally; mesepimera narrower; species very small in size.....8
- Marginal line, when viewed laterally, nearly straight, becoming rather abruptly and strongly bent downward through basal third; mesepimera broader and not extending quite so far toward the coxæ; metepisternal suture coarse, straight as usual; size large, the body black, the elytra feebly rufescent at tip, not distinctly punctulate; antennæ long and slender. Length 2.3–2.5 mm.; width 1.3–1.35 mm. Rhode Island (Boston Neck), Virginia and Arkansas.....**deflexa** *Csy.*
- 8—Body moderately convex longitudinally, the metasternum more elongate, the episternal suture not very coarse; color pale flavescent throughout, the pronotum gen-

erally shaded a little darker; basal stria of the elytra fine, disappearing completely somewhat before attaining the middle of the width. Length 1.15 mm.; width 0.68 mm. Pennsylvania (near Philadelphia).....**pallida**, sp. nov.

Body strongly convex longitudinally, smaller in size, deep black, the elytra rufescent toward tip; under surface blackish, the abdomen and legs fulvous; metepisternal suture much shorter and very coarsely excavated; basal stria of the elytra stronger and only interrupted for a short space just beyond the middle of the width. Length 0.88 mm.; width 0.62 mm. Massachusetts (Tyngsboro).

abdominalis, sp. nov.

9—Basal stria of the elytra entire; body larger, blackish throughout, the elytral apices very narrowly rufescent; antennæ moderately long and slender, bristling with rather long stiff setæ; basal lobe of the pronotum rather feeble and broadly rounded; scutellum distinct. Length 1.7 mm.; width 0.95 mm. Texas (Columbus).....**texana** Cyp.

Basal stria of the elytra much abbreviated externally; size minute.....10

10—Basal angles of the prothorax normally acute.....11

Basal angles obtusely truncate at tip; metepisternal suture arcuate14

11—Scutellum very short and indistinct; abdomen concolorous; metepisternal suture straight.....12

Scutellum distinct and longer than usual; body deep black throughout, the entire abdomen abruptly pale rufous; size very minute.....13

12—Metepisternal suture coarse; scutellum extremely small, short and very transverse; body very smooth and polished, rufous throughout, the pronotum piceous; antennæ moderate. Length 1.3 mm.; width 0.72 mm. Michigan.

discolor, sp. nov.

Metepisternal suture finer; scutellum less abbreviated, but little more than twice as wide as long; body rufo-piceous to blackish in color, the abdomen pale at tip. Length 1.15-1.25 mm.; width 0.65-0.7 mm. Pennsylvania (near Philadelphia) and Michigan.....**picea** Cyp.

13—Rather narrowly oval, highly polished and impunctate; metepisternal suture feebly arcuate, fine and rather distinctly punctured; mesepimera rather small and narrow, scarcely extending more than half way to the coxæ. Length 0.95 mm.; width 0.55 mm. Rhode Island (Boston Neck).....**rubriventris**, sp. nov.

14—Rather stout, polished, black throughout above and beneath, the legs feebly rufescent. Length 0.9-1.0 mm.; width 0.58-0.68 mm. Rhode Island (Boston Neck), Massachusetts, Michigan and Texas (Austin).....**nana** Cyp.

Nana is a very widely distributed species of minute size, and is quite aberrant in the form of the basal angles of the prothorax and in the strongly arcuate metepisternal suture, but it does not differ generically.

Scaphiomicrus, gen. nov.

The species described by LeConte under the name *Scaphisoma pusilla*, must form the type of a distinct genus because of the shorter and thicker antennæ, situated at a greater distance from the eyes,

which are notably smaller, the shorter tarsi, and especially, because of the radically different form of the post-coxal plates of the abdomen. These plates in *Scaphisoma* are very short and only developed internally, the bounding arc extending outward externally, very gradually approaching the base of the segment, while in *Scaphiomicrus* the plates are more nearly semi-elliptic, having the outer part of the bounding curve directed upon the base without change of direction toward the sides of the body, somewhat, in fact, as in the subgenus *Pullus* of the Coccinellidæ. The species are all very much more minute than in *Scaphisoma*, and those which are represented before me may be distinguished by the following characters :—

- Abdominal plates almost evenly parabolic in form, the apex more broadly rounded and the outer side more arcuate and approaching the base scarcely less obliquely than the inner side ; sutural line of the elytra not flexed outward basally.....2
- Abdominal plates more narrowly rounded at apex, the external branch of the bounding curve much less arcuate than the internal, and directed almost perpendicularly upon the base : sutural line of the elytra flexed outward at base, parallel to the basal margin ; elytra blackish, gradually and broadly pale toward tip.....5
- 2—Elytra bicolored, black in about basal half, the remainder rufous.....3
- Elytra pale throughout.....4
- 3—Abdominal plates extending much beyond the middle of the segment, the punctures and the reticulations of the segment almost effaced ; form rather short and stout. Length 0.8–0.95 mm.; width 0.55–0.65 mm. North Carolina (Asheville)**pusillus** Lec.
- Abdominal plates not quite extending to the middle of the segment, the surface of which is distinctly reticulate and finely, sparsely punctulate ; metasternum strongly, though sparsely, punctate ; body slightly larger, the elytra distinctly longer when compared with the prothorax. Length 1.1 mm.; width 0.7 mm. Rhode Island (Boston Neck).....**dimidiatus**, sp. nov.
- 4—Entire body and legs pale fulvo-testaceous throughout, the form more narrowly oval ; abdominal plates broadly rounded, not extending quite to the middle of the segment ; metasternal punctures minute and very feeble. Length 0.9 mm.; width 0.6 mm.; Michigan,—Mr. Schwarz.....**flavescens**, sp. nov.
- 5—Sutural line of the elytra extending outward along the base to inner third.....6
- Sutural line extending nearly to the middle of the width ; body more minute and less oval.....7
- 6—Abdominal plates relatively larger, extending to the middle of the segment ; body blackish, the legs, antennæ and apical half of the abdomen pale ; elytral punctures sparse but rather distinct, effaced as usual toward base. Length 0.85 mm.; width 0.57 mm. Lake Superior**lacustris**, sp. nov.
- Abdominal plates very small, extending but little beyond basal third of the length, narrowly rounded at apex ; body in coloration and sculpture nearly similar to *lacustris*, the outline a little more broadly oval. Length 0.9 mm.; width 0.65 mm. Iowa (Keokuk).....**nugator**, sp. nov.

- 7—Minute in size, blackish, the elytra gradually rufescent behind the middle, sparsely, finely and very obsoletely punctate, the punctures almost effaced; legs yellow; abdominal plates well developed, extending almost to the middle. Length 0.7 mm.; width 0.47 mm. Oregon.....**exiguus**, sp. nov.

CORYLOPHIDÆ.

The Corylophidæ constitute a small family, evidently allied to the Silphidæ, as shown by antennal structure, and, like them, display great variety in external habitus; they are, however, remarkably homogeneous among themselves in sternal and abdominal structure. In *Orthoperus* a relationship with Scaphidiidæ can be observed, and there are some characters, such as the 4-jointed tarsi with the third joint small, the post-coxal plates of the Corylophini and the projecting rounded pronotum of the Parmulini—homologous with Crano-phorini,—which proclaim an indubitable relationship with the Coc-

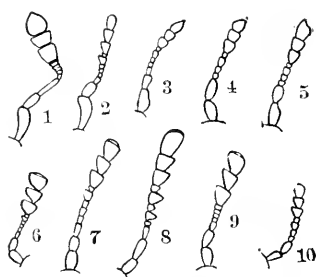


FIG. 2.—Antennæ of CORYLOPHIDÆ—1 *Pathona* (*Corylophodes* is similar, except that the third joint is shorter than the second); 2 *Groncrus* (also nearly of *Kypobius*); 3 *Sericoderus*; 4 *Orthoperus*; 5 *Eutrellia*; 6 *Molamba lunata*; 7 *Molamba obesa*; 8 *Sacium montanum*; 9 *Arthrolophus nimius*; 10 *Chenigmaticum californicum*.

cinellidæ. The chief difference in tarsal structure between these two families resides, indeed, simply in the freedom of the third joint, this being generally anchylosed to the fourth in Coccinellidæ. The anterior coxæ are narrowly separated, displaying variations which serve to define tribal groups, and the cavities are broadly closed behind; the intermediate are more widely separated and the posterior mutually very remote. The scutellum is always distinct, though small, the abdomen hexamerous, the first segment being much the longest and the palpi short, stout and acuminate. The American species may be assigned to four tribes as follows: --

- Prothorax widest at base.....2
 Prothorax narrowed at base ; body narrower and lathridiiform.....3
 2—Anterior coxæ long and narrow, inclosed within deep oblique fossæ and attached more externally, the intermediate and posterior generally with distinct post-coxal plates ; body rounded or oval and convex, generally glabrous ; antennæ 11- or 9-jointed.....CORYLOPHINI
 Anterior coxæ short, oblong ; body pubescent, the pronotum covering the head, convex, the edges not explanate and the hind angles greatly produced posteriorly and acute ; antennæ 10-jointed ; abdomen more extensile, with the basal segment shorter than usual ; post-coxal plates wanting.....SERICODERINI
 Anterior coxæ larger, less deeply imbedded and globular ; body more depressed, oblong or oval, pubescent, the pronotum completely concealing the head, explanate at the margin, the hind angles not produced posteriorly ; antennæ 11- to 10- or possibly 9-jointed.....PARMULINI
 3—Head completely exposed from above ; anterior coxæ small, oval ; antennæ 9-jointed ; integuments sparsely and feebly pubescent.....ENIGMATICINI

All of these tribes occur on both sides of the continent, but in the first tribe the genera with 9-jointed antennæ are the only ones which have thus far appeared in the Pacific district.

CORYLOPHINI.

The species of this tribe may be readily known by their rounded or oval convex form and shining glabrous integuments. The genera may be separated as follows :—

- Antennæ 11-jointed, inserted between and near the eyes, widely separated at base, the eyes larger and coarsely faceted ; epipleuræ rather wide and inflexed.....2
 Antennæ 9-jointed, inserted more anteriorly and more distant from the eyes, which are smaller and less coarsely faceted ; basal joint shorter ; epipleuræ extremely narrow or subobsolete, not at all inflexed ; labrum broadly rounded ; prothorax emarginate at apex, the head in great part exposed ; post-coxal plates very short ; tarsi slender.....5
 2—Head very deeply inserted within the prothorax, the anterior margin of which is evenly rounded and strongly descending ; post-coxal plates large, with rounded outline, the subbasal discal line of the metepisterna very oblique ; labrum rounded or subquadrate.....3
 Head partially protruded and less concealed by the overhanging margin of the prothorax ; post-coxal plates very short, the subbasal line of the metepisterna nearly transverse ; labrum small, triangular, with the apex acuminate ; tarsi dilated.....4
 3—Post-coxal plates of the abdomen more strongly rounded, the external part of the bounding line directed upon the base well within the sides ; third antennal joint elongate, longer than the second.....**Bathona**
 Post-coxal plates of the abdomen less arcuate posteriorly, the bounding line extending to the sides of the body ; third antennal joint elongate but shorter than the second.....**Corylophodes**

- 4—Head entirely concealed from above, the prothorax almost evenly rounded anteriorly and more descending, the margins not distinctly thickened and the hind angles acute and somewhat more posterior than the median parts of the base; maxillary palpi moderately stout, regularly acuminate.....**Gronevus**
- Head partially visible from above, the prothorax sensibly sinuate at apex, the margins with a distinct thickened head and the hind angles right; maxillary palpi very stout.....**Rypobius**
- 5—Anterior tibiae flattened, the external edge acute, the axial line feebly arcuate throughout; body larger.....**Eutrilia**
- Anterior tibiae slender, inwardly bent distally; body very minute.....**Orthoperus**

I have restored the original spelling of *Rypobius*, although it may not be etymologically correct. The European *Moronillus* of Du Val is identical, having similar structure and habits.

Bathona, gen. nov.

In this genus the body is broadly oval, convex, polished and glabrous, with the edges of the pronotum subexplanate and diaphanous, and the hind angles not posteriorly produced. The tarsi are long and are compressed toward base. The species may be defined as follows:—

- Body moderately convex, the sides and apex of the pronotum widely subexplanate; antennal club large.....2
- Body very strongly, globularly convex, the limb of the pronotum very narrowly subexplanate; antennal club rather less developed.....3
- 2—Elytral punctures small and sparse but very distinct, impressed, each bearing, as usual, an excessively minute fine decumbent hair, black, the pronotum piceous-black, the edges broadly transparent and hyaline; under surface paler, the legs and antennae rufescent. Length 1.35 mm.; width 0.9 mm. North Carolina (Asheville).....**carolinæ**, sp. nov.
- Elytral punctures smaller and almost effaced; body smaller, black, the pronotal limb broadly transparent and hyaline; under surface and legs paler. Length 1.1 mm.; width 0.75 mm. Virginia (Norfolk).....**virginica**, sp. nov.
- 3—Impunctuate, piceous in color, the edges of the pronotum narrowly transparent and hyaline, the disk gradually darker toward the middle and base. Length 1.0 mm.; width 0.78 mm. North Carolina (Asheville).....**convexa**, sp. nov.
- Smaller and with feeble but visible traces of punctuation, piceous or testaceous in color, the under surface and legs more flavate. Length 0.8 mm.; width 0.7 mm. Pennsylvania (near Philadelphia).....**sphæricula**, sp. nov.

Individuals are rare, but *virginica* is represented before me by a number of examples, which exhibit no noteworthy variability.

Corylophodes *Matth.*

As in the preceding, the antennæ in this genus have five small compact and gradually wider joints between the third and the first joint

of the club, and there is no vestige of an enlargement of the second joint before the club as there is in *Rypobius*, *Gronevus* and *Orthoperus*. The structure of the shaft differs in fact very radically, and, in this way, these genera are widely isolated. *Corylophodes* resembles *Bathona* in general structure, but, besides the characters indicated in the table, it differs in the generally more narrowly oval form of the body, shorter and less developed prothorax, finely margined along the basal lobe, and more slender and less coarctate five antennal joints immediately succeeding the third. The tarsi are nearly similar, but the anterior are feebly dilated in the male. The three species before me may be thus distinguished among themselves:—

- Elytral punctures sparse but rather coarse, deeply impressed and very distinct, blackish-piceous, the limb of the pronotum broadly transparent and hyaline; legs and antennæ paler. Length 0.9 mm.; width 0.72 mm. Rhode Island, Pennsylvania and North Carolina (Asheville).....**marginicollis** Lec.
- Elytral punctures extremely minute and subobsolete.....2
- 2—Form narrowly oval, rufo-piceous in color, the pronotum with broad hyaline margin as in the preceding and succeeding species. Length 0.85 mm.; width 0.65 mm. Florida**impunctatus**, sp. nov.
- Form more broadly oval, black, the legs, trophi and antennæ pale; prothorax transverse, the basal angles obtusely blunt as usual. Length 0.8–0.9 mm.; width 0.7–0.75 mm. Texas (Brownsville).....**subtropicus**, sp. nov.

As pointed out by Mr. Matthews, the distinguishing feature of *Corylophodes* is the slender third antennal joint shorter than the second, but the author makes no allusion at all to the remarkable post-coxal plates. The genus as extended by its author in the "Monograph" is very composite, and I am unable to place the *C. schwarzi*, described therein from California.

Gronevus, gen. nov.

This and the succeeding genus differ very greatly from the two preceding, in the very short and almost obsolete post-coxal plates, the meso-coxal being even much less developed than in *Orthoperus*, but the subtransverse line at the base of the metepisterna is present as in that genus; the comparatively wide and steeply inflexed epipleuræ distinguish them at once however from *Orthoperus* and *Eutrilia*. They also differ quite radically in antennal structure, and from all others of the tribe, in the shorter and slightly dilated tarsi. In *Gronevus* the limb of the pronotum is hyaline and moderately widely subexplanate, the base not margined, and the hind angles are acute and dis-

The genus *Gleosoma*, of Wollaston, occurring in the Island of Madeira, which has been considered to be identical with *Rypobius*, is altogether distinct, not only in its 10-jointed antennæ and type of elytral sculpture, but in its habits and gait, the single species of *Gleosoma* taking refuge under stones and running with great velocity when disturbed—habits wholly foreign to *Rypobius*. It may however be placed near *Rypobius* in a tabular arrangement of the genera of the family. A Spanish specimen sent me by Mr. Keitter under the name *Rypobius velox*, differs from the true *Rypobius* also in the elytral epipleuræ, which are inclined upward and not at all inflexed, and also in the hind angles of the prothorax, which are acute and sensibly produced posteriorly. I am unable to count the joints of the antennæ with certainty in this example.

The two species of *Rypobius* before me may be distinguished very readily as follows:—

- Base of the prothorax almost rectilinear, piceous, the prothorax and under surface paler; micro-reticulation of the upper surface very deep, the lustre somewhat alutaceous. Length 1.0-1.2 mm.; width 0.7-0.85 mm. Rhode Island, New Jersey and Virginia (near the ocean beaches).....**marinus** Lec.
- Base of the prothorax distinctly bisinuate, blackish, the pronotum rufescent; legs, antennæ and trophi flavate, polished, the micro-reticulation of the upper surface almost completely effaced; size very much smaller. Length 0.68 mm.; width 0.5 mm. Texas (Columbus).....**minutus**, sp. nov.

In both these species the first abdominal segment is as long as the next three combined. *Minutus* must bear some resemblance to the Central American *guatemalensis* Matth., but differs in sculpture.

Eutrilia, gen. nov.

The single representative of this genus resembles a very large, broadly oval *Orthoperus*, and is evidently very closely related, being identical in the form of the prothorax and in the structure of the head, coxæ and under surface. It however differs in the form of the anterior tibiæ, as indicated in the table, and in the virtual absence of any trace of epipleuræ, these being indicated only by a slight thickening of the elytral margins due to the very minute marginal bead. The meso-coxal plate is rather well developed, but the metacoxal plate is extremely short as in *Orthoperus*. The intermediate tibiæ are slightly thickened externally just beyond the middle with arcuate outline, the posterior straight and the tarsi slender, the claws small, arcuate and very slender. The first ventral segment is as long as the next four

combined. The integuments are micro-reticulate and very finely punctate, each puncture bearing a small decumbent hair, these however being a little longer and more conspicuous than in *Rypobius*. The scutellum is well developed, with broadly parabolic outline, and the elytral suture is not at all margined. The wings are well developed, the fringing hairs very short. As in some species of *Orthoperus*, especially *scutellaris*, there is a feeble impressed longitudinal line on each elytron near outer fifth or sixth, extending from the base for a short distance:—

Oval, convex, moderately shining, brownish-testaceous in color throughout, the prothorax moderately developed, the base broadly parabolic, the sides strongly convergent, moderately arcuate and continuous in curvature with those of the elytra; punctures not distinctly visible under a hand lens of moderate power. Length 0.95 mm.; width 0.8 mm. California.....**bruanea**, sp. nov.

Orthoperus Steph.

The species of this genus are among the most minute of the Coleoptera, and may be readily recognized by their oval, moderately convex form, exposed head and 9-jointed antennæ, the fifth joint being generally notably longer and sometimes thicker than the sixth. The epipleuræ are represented by a narrow side margin of the descending flank, delimited by a fine line. The integuments of the body are more or less shining, micro-reticulate and virtually glabrous. The pronotum is very finely and feebly margined at base, the flanks not greatly descending, becoming very narrowly and feebly reflexo-explinate toward the basal angles, which are nearly right, not at all produced posteriorly and narrowly rounded. The scutellum is distinct though small and generally parabolic in shape. The species are rather numerous but closely allied among themselves as a rule; those before me may be recognized as follows:—

- | | |
|---|----------------------------|
| Elytral suture not margined except posteriorly..... | 2 |
| Elytral suture finely margined to the scutellum..... | 8 |
| 2—Elytra without trace of punctuation of any kind, the minute reticulation distinct; body much larger than usual, evenly elliptical, glabrous, pale brown in color throughout, the metasternum impunctate and with very sparse and microscopic hairs. Length 0.82 mm.; width 0.62 mm. Colorado..... | princeps , sp. nov. |
| Elytral punctures wanting but replaced by very small, sparse and V-shaped scratches; size rather large..... | 3 |
| Elytral punctures normal, being well-defined points but always very minute and sparse; size small or very minute..... | 4 |
| 3—Form somewhat oblong and narrowly oval, black throughout, the legs and antennæ rufescent; micro-reticulation distinct; metasternal punctures sparse but distinct. | |

- Length 0.7 mm.; width 0.45 mm. Lake Superior, Northern Illinois and California (Siskiyou Co.).....**scutellaris** Lec.
- Var. A—Piceous and more broadly oval with more arcuate sides, the micro-reticulation less distinct and the scratch-like punctulation more visible. New York and Ohio.....**piceus**, v. nov.
- Var. B—Similar to *ficus* but with the punctules sparse and the elytra more rapidly narrowed toward tip. Washington State (Spokane).....**lucidus**, v. nov.
- 4—The punctures strong deep and very distinct, more especially so toward the suture and base of each elytron and toward the base of the pronotum, piceous in color, the legs luteo-flavate; form rather narrowly oval. Length 0.65 mm.; width 0.4 mm. California (Sta. Cruz Co.).....**cribratus** Matth.
- The punctures extremely fine throughout and only visible under strong amplification; size small.....5
- 5—Form oblong-oval.....6
- Form evenly oval with more arcuate sides.....7
- 6—Piceous-black, the micro-reticulations finer and stronger, giving a feebly subalutaceous lustre. Length 0.6 mm.; width 0.4 mm. New Jersey, Pennsylvania, Delaware, North Carolina and Florida.....**glaber** Lec.
- Paler, piceous, smaller and more polished, the reticulation coarser and less visible; suture more strongly margined posteriorly. Length 0.5 mm.; width 0.35 mm. Florida (Enterprise).....**suturalis** Lec.
- 7—Reticulations feeble, the surface more highly polished, piceous in color, the eyes separated on the front by nearly three times their own width. Length 0.6 mm.; width 0.4 mm. Texas (Austin).....**texanus**, sp. nov.
- Reticulations strong; body smaller and paler in color, the eyes distinctly larger, separated on the front by but little more than twice their own width; metasternum more coarsely reticulate. Length 0.5 mm.; width 0.35 mm. Illinois.
micros, sp. nov.
- 8—Scutellum more transverse, ogival or rounded; body more oblong-oval9
- Scutellum scarcely wider than long, triangular, the sides straight.....10
- 9—Reticulations feeble and finer, the surface polished; elytral punctures excessively fine and scarcely visible; color testaceo-piceous; head well developed. Length 0.65 mm.; width 0.48 mm. Arizona (Tucson) and southern California.
arizonicus, sp. nov.
- Reticulations strong, the lustre somewhat alutaceous; punctures extremely fine and sparse but more visible; head smaller, the coloration darker, piceous-black. Length 0.6 mm.; width 0.4 mm. Texas (Columbus).....**alutaceus**, sp. nov.
- 10—Body oval, pale testaceous in color, polished, the reticulation very feeble, the punctures almost completely obsolete but simple; sutural margin strongly defined, extending unbroken by the scutellum and along the base to beyond the middle of the width; head well developed, meso-coxal plates shorter, with the bounding line more rectilinear and transverse. Length 0.55 mm.; width 0.35 mm. Bahamas (Harbor Island).....**bahamicus**, sp. nov.

Elongatus of LeConte, belongs to the Enigmaticini. The *crotchii* of Matthews I, have not seen.

SERICODERINI.

This tribe is well differentiated from the preceding in the oval pubescent body, with more extensible abdomen and absence of distinct post-coxal plates, and from the following in the non-explanate limb of the pronotum: from both it may be distinguished by the 10-jointed antennæ and shorter basal segment of the abdomen, this, in the extended condition, scarcely equaling in length the next two together. There is but a single genus.

Sericoderus Steph.

The species of this genus are so closely allied among themselves that it is scarcely possible to detect structural differences of any kind, and the names given below might be considered to represent subspecies of a single type form. The head is completely concealed from above and moderately deeply inserted, the pronotum broadly rounded at apex and with the hind angles acute and considerably produced posteriorly. The antennæ are slender, with the basal joint narrowly oval and inserted in shallow frontal foveæ at a slight distance from antero-internal margin of the eyes, the latter usually well developed and coarsely faceted. The frontal margin is feebly sinuato-truncate and the labrum short and broadly rounded. The tibiæ and tarsi are slender, and the elytral epipleuræ narrow, becoming strongly inflexed toward base. The following forms seem to be worthy of distinctive names:—

- Species of the Atlantic and Gulf regions.....2
 Species of the Pacific slope.....5
 2—Elytra more strongly narrowed from base to apex.....3
 Elytra feebly narrowed, the form more quadrate.....4
 3—Larger, pale luteo-flavate in color, the usual nubilate subapical spot of the pronotum piceous. Length 0.9 mm.; width 0.65 mm. New York to Lake Superior**flavidus** Lec.
 Smaller, the elytra generally piceous, the pronotum flavate with the subapical spot darker. Length 0.75–0.85 mm.; width 0.6–0.65 mm. Massachusetts, Pennsylvania, and North Carolina.....**obscurus** Lec.
 4—Color pale flavate throughout, the elytra never darker, smaller in size than *flavidus* and more southern in distribution. Length 0.75 mm.; width 0.6 mm. Texas (Brownsville and Austin), Florida and Illinois.....**subtilis** Lec.
 5—Larger, very broadly oblong, coarsely pubescent, dark rufo-testaceous, the usual subapical spot of the pronotum darker; elytra but feebly narrowed from base to apex; metasternum coarsely imbricato-reticulate but not distinctly punctured. Length 0.85 mm.; width 0.68 mm. California (Monterey).

quadratus, sp. nov.

Very small, the elytra more rapidly narrowed from the base, piceous-brown in color, the pubescence rather less coarse; metasternum distinctly punctured, especially toward the sides. Length 0.7 mm.; width 0.55 mm. California (Sonoma Co.).

debilis, sp. nov.

When discovered, individuals are rather abundant. *Sericoderus* is said in the "Biologia" to have the antennæ 11-jointed, but these organs are quite evidently 10-jointed in our species, and the details given by Mr. Matthews for the antennæ of *S. latus* show that it should properly form a genus distinct from *Sericoderus*.

PARMULINI.

The numerous species of this tribe can be recognized at once by the oblong or oval and less convex pubescent body, more or less widely subexplanate at the lateral and apical limb of the pronotum, and the rectangular thoracic angles. The genus *Sacium* of LeConte, is said by Heyden, Reitter and Weise to be the same as *Parmulus* of Gundlach, but, as the LeContean *Sacium* is composite, I am in doubt as to which if any is the true *Parmulus* and have therefore not adopted the name for any one of our genera; it is, however, retained for the tribal designation. The three genera before me may be identified by the following characters:—

- Antennæ 11-jointed; prosternum well developed in front of the coxæ, the posterior margin of the buccal opening deflexed at the middle, forming a broad inferiorly vertical liguliform process.....2
- Antennæ 10-jointed; prosternum extremely short in front of the coxæ, the buccal margin not at all deflexed.....3
- 2—Body elongate and subparallel; antennæ more elongate, the club relatively longer, looser and more serriform, the fifth and seventh joints both enlarged; basal joint of the hind tarsi shorter, scarcely as long as the next two combined, the basal joints thicker.....**Sacium**
- Body oval, with more arcuate sides; antennæ shorter, with a more slender shaft and stouter and more compact club, the seventh joint enlarged, the fifth normal; hind tarsi with the basal joint elongate and more slender, always much longer than the next two combined.....**Molamba**
- 3—Body oval or oblong-oval, rather more convex but nearly as in *Molamba*; antennæ moderately elongate, the club loose and well developed, the elongate third joint followed by four small subequal joints; posterior tarsi slender, with the basal joint elongate, the anterior more or less dilated at base; species generally minute.....**Arthrolips**

The epipleuræ are horizontal, moderately wide, narrowing gradually and disappearing behind the middle, the first ventral segment very long, equaling the next three or four combined.

These genera are all widely distributed over the continent, but *Sacium* has not yet been found near the Pacific coast line, although occurring in Utah: it is more northern in habitat than the other two. *Molamba* may perhaps prove to be the same as *Parmulus*, but at present I have no means of determining this.

Previous authors appear to have entirely overlooked the very conspicuous vertical ligula at the hind margin of the buccal opening in *Sacium* and *Molamba*, a character wholly wanting in *Arthrolips*.

Sacium Lec.

In this genus, and the next, the limb of the pronotum is broadly reflexo-explanate antero-laterally, and is scarcely at all so at the middle of the apical margin, while in *Arthrolips* the edge seems to be more narrowly and evenly reflexed throughout the external circumference. *Sacium*, as understood by Mr. Matthews in the "Monograph," is composite, and *lugubre* should have been assumed as the type. The genus includes some of the largest species of the family known to me, and the four represented in my cabinet may be thus defined in brief:—

- Prothorax as long as wide or very nearly; elytral punctures and pubescence rather sparse2
 Prothorax shorter and more transverse, much wider than long in both sexes; elytral punctures and pubescence dense.....4
 2—Elongate, twice as long as wide or very nearly, the elytral punctures smaller and rather sparser, piceous to blackish in color, with the usual two pale patches at the apex of the pronotum. Length 1.75–2.1 mm.; width 0.9–1.0 mm. Colorado**montanum**, sp. nov.
 Less elongate, always distinctly less than twice as long as wide, the elytral punctures stronger and less sparse.....3
 3—Piceous in color to blackish, the elytral suture sometimes slightly paler. Length 1.6–1.8 mm.; width 0.85–0.9 mm. Lake Superior.....**lugubre** Lec.
 Deep black, the suture not paler; body a little larger and relatively broader. Length 1.7–2.0 mm.; width 1.0–1.1 mm. Utah (southwestern).....**nigrum**, sp. nov.
 4—Body rather smaller, piceous-brown in color, the under surface and legs still paler. Length 1.65 mm.; width 0.85 mm. Lake Superior.....**obscurum** Lec.

The elytra are uniform in color throughout and there is an entire absence of the paler maculation so characteristic of the two following genera.

The genus represented by *Clypeaster maderæ* Kr. (*pusillus* Woll., nec Gyll.) is radically distinct from *Sacium* in the structure of the antennæ as figured by Wollaston, and I would propose the generic name **Clypeastodes** for that species.

Molamba, gen. nov.

The species are much more numerous than those of *Sacium* and are generally of smaller size, though *obesum* is as large as any representative of that genus discovered thus far. Those before me may be conveniently arranged as follows:—

- Elytra uniform in coloration or devoid of distinctly defined pale maculation.....2
 Elytra dark in color, with rufous or flavous maculation.....3
 2—Pubescence long, distinct and rather abundant; body large, piceous, the pronotum pale anteriorly, but darker at the middle as usual; punctures fine, rather close-set; elytra distinctly longer than wide, sometimes very feebly rufescent behind the middle in a small area but not obviously so. Length 1.9 mm.; width 1.2 mm. California.....**obesa**, sp. nov.
 Pubescence virtually wanting, each of the very minute sparse punctures having an exceedingly minute hair, only visible under high power, the surface polished; body much smaller, black, the pronotum piceous-brown, with two apical albescent areas; elytra perfectly uniform black, scarcely longer than wide, the abdomen much extended behind them in the single type. Length (to extremity of elytra), 1.0 mm.; width 0.7 mm. Texas. (Columbus).....**specularis**, sp. nov.
 3—Elytra each with a small pale spot on the median line well behind the middle.....4
 Elytra with a transverse pale band, sometimes failing to attain the sides or interrupted at the suture.....6
 4—The pale spot nubilate; elytra black or paler from immaturity; punctures fine and moderately close, the vestiture distinct. Length 1.3–1.6 mm.; width 0.8–0.9 mm. Colorado and Utah, one specimen not specifically distinguishable labeled “New York.”.....**biguttata** Lec.
 The pale spot clearly defined; size smaller.....5
 5—Antennae moderately long, nearly as in *amabilis*; punctures fine, rather sparse, the pubescence distinct; metasternum finely but distinctly punctured and with short and stiffer hairs. Length 1.1–1.3 mm.; width 0.7–0.8 mm. Massachusetts and Maryland to Iowa and Missouri.....**lunata** Lec.
 Antennae very short, the club moderate but as long as the entire preceding part omitting the basal joint; body almost exactly as in *lunata* but much smaller, the metasternum more minutely punctured but with longer and finer hairs. Length 0.88 mm.; width 0.6 mm. Florida (Lake Monroe).....**parvula**, sp. nov.
 6—The pale band at the middle of the length consisting of a transverse discal spot on each, the elytra each with two large subconfluent basal spots also; pubescence dense and conspicuous, the color piceous; pronotum darker along the median line. Length 1.5 mm.; width 0.8 mm. Texas.....**lepida** Lec.
 The pale band just visibly behind the middle and formed as in *lepida*, the body throughout as in that species but wholly devoid of pale spots at the elytral base; punctures minute but rather close-set. Length 1.4–1.6 mm.; width 0.8–0.85 mm. Iowa.....**ornata**, sp. nov.
 The pale band much behind the middle, more conspicuous and attaining the sides of the elytra.....7
 7—The pale band nubilously interrupted at the suture; body nearly as in the two pre-

- ceding species, the elytra indistinctly paler at or near the base subexternally; pubescence distinct and rather dense, the punctures minute. Length 1.3 mm.; width 0.8 mm. California **amabilis** Lec.
- The pale band very conspicuous, not at all interrupted at the suture; pubescence coarser and not so dense.....8
- 8—Piceous-black, the pronotum pale, clouded with blackish at the middle anteriorly; elytra each with a pale spot at the humeral callus, the punctures distinct, together much longer than wide. Length 1.4-1.7 mm.; width 0.85-1.0 mm. District of Columbia..... **fasciata** Say
- Black, the pronotum as in *fasciata*, the elytra but little longer than wide, the transverse pale band still wider and more conspicuous, wholly devoid of a subbasal pale spot, the punctures more minute and rather sparser; body shorter and stouter. Length 1.5 mm.; width 1.0 mm. Texas (Columbus) **decora**, sp. nov.
- The *Sacium balteatum*, of Matthews, described from North Carolina, I have not seen; it has on the elytra a straight transverse fascia behind the middle not extending to the sides, and also the apices, yellow.
- Lepida* was placed in *Arthrolips* by Mr. Matthews but incorrectly.

Arthrolips Erichs.

This genus resembles the last in the outward habitus of the species, but these are in general much more minute and more narrowly oval or oblong-oval and perhaps a little more convex. In the structure of the anterior parts of the prosternum and of the antennæ it is radically different. The species are nearly as numerous as those of *Molamba*, and are equally widely disseminated over the more southern parts of the United States: as far as known to me they may be distinguished by the following characters:—

- Elytra dark in color, with paler maculation behind the middle.....2
- Elytra unicolorous.....6
- 2—Elytra each with an isolated spot which does not attain the suture; larger species3
- Elytra with a broad band crossing the suture; size very minute.....5
- 3—The spot behind the middle large, oblique and more or less rounded; body piceous, the pronotum paler, becoming broadly diaphanous at apex as usual, the median line remaining dusky; elytra finely, very closely punctate, distinctly pubescent, without basal or subbasal pale marking; legs pale. Length 1.2-1.35 mm.; width 0.78-0.82 mm. Southern California..... **nimius**, sp. nov.
- Var. A—Similar but stouter and more rounded at the sides, the spot less rounded and obliquely elliptical; elytra more rapidly rotundato-convergent behind and narrower at tip. Length 1.4 mm.; width 0.9 mm. California (Owens Valley) **robustus**, v. nov.
- The spot transverse and crescentiform, being broadly sinuate anteriorly.....4
- 4—Elytra black, minutely and not so closely punctate, the limb not paler and without a humeral pale area; pronotum not paler, except at the apical limb and very

narrowly at the sides to the base; integuments polished; under surface blackish, the legs pale. Length 1.2 mm.; width 0.75 mm. Virginia (Fort Monroe).

cinctus, sp. nov.

Elytra pale piceous-brown, the entire external limb flavescent, broadening over the humeral regions; body narrowly oblong-oval; under surface pale, the legs flavate. Length 1.0 mm.; width 0.65 mm. Florida (Tampa).....**mollinus** *S. hz.*

5—Pubescence of the elytra moderately abundant and quite distinct, the hairs coarse; elytra blackish, the pale band broad, sinuate anteriorly at the suture; pronotum and legs pale. Length 0.62–0.7 mm.; width 0.42–0.48 mm. California.

scitulus *Lec.*

Pubescence almost wholly wanting, each of the very minute sparse punctures bearing an extremely minute hair only visible under high power; surface polished, the elytra piceous, the band transverse; pronotum pale, clouded with piceous at the middle of the disk. Length 0.8 mm.; width 0.45 mm. Florida (Tampa).

splendens *Schz.*

6—Elytra highly polished, without trace of reticulation.....7

Elytra minutely reticulate, the punctures minute and less visible; pubescence short but rather abundant and quite distinct; body pale luteo-flavate in color throughout, the elytra sometimes slightly darker. Length 0.7–0.8 mm.; width 0.4–0.53 mm. California and Iowa. [*Sacium californicum* Matth.].....**decolor** *Lec.*

7—Punctures small but strong and distinct throughout above, quite close-set, the pubescence moderately long and abundant, coarse and very distinct; color blackish, the pronotum paler. Length 0.95 mm.; width 0.65 mm. Massachusetts and Pennsylvania.....**misellus** *Lec.*

Punctures minute and sparse, scarcely visible except under high power, each bearing an exceedingly minute hair as in *splendens*, blackish, the pronotum paler, the apical whitish spots small and rather widely separated. Length 0.8 mm.; width 0.55 mm. Texas (Columbus).....**sparsus**, sp. nov.

There may be some closely allied species included in the material before me which is referred to *decolor*, but in any event they would be so doubtfully distinct that there could be no advantage gained in separating them; there can be little or no doubt of its identity with the *Sacium californicum*, of Matthews.

The antennæ in *Arthrolips* occasionally appear to have only nine joints, the slightly elongate third joint followed by three instead of four minute joints, but this appearance may be due simply to the difficulty in observing these organs in their natural position.

ÆNIGMATICINI.

The general habitus of the few species comprising this tribe is wholly different from that of the preceding tribes, the body being narrow and somewhat as in *Corticaria*. There has been but one genus characterized thus far:

Ænigmaticum Matth.

The body is parallel, moderately convex, the head entirely exposed and but slightly inclined, the eyes moderate in size, convex, with rather coarse convex facets as usual, the antennæ inserted at some distance from their antero-internal margin in angulate emarginations of the front. The prothorax is narrowed at base and truncate at base and apex, the apical angles very obtusely rounded, the basal more distinct but obtuse, the clytral suture strongly and widely margined, the line extending along the well-developed and transversely triangular scutellum nearly to outer third of each elytron. The anterior coxæ are small and distinctly, though not broadly, separated, and the prosternum is largely developed in front of them: the middle coxæ are rather narrowly, the posterior very widely, separated, the legs slender, with the tibiæ somewhat clavate and the tarsi rather slender, with the basal joints small. The basal segment of the abdomen is about as long as the next three combined. The two species known to me are minutely reticulate and subglabrous, each puncture bearing a very small but distinct cinereous hair; they may be defined as follows:—

- Prothorax broadly subangulate and widest at the middle, the sides straight or very feebly sinuate thence to the basal angles; body dark castaneous, finely and sparsely but very distinctly punctate. Length 0.75–0.9 mm.; width 0.42–0.5 mm. California (San Francisco).....*californicum* Cyl.
 Prothorax almost evenly rounded at the sides, becoming much more convergent toward apex, the latter scarcely more than half as wide as the base, the disk widest behind the middle and narrowed but slightly at base; punctures sparse and very minute, those of the pronotum more visible and having the form of minute transverse arcs, enclosing each a very minute hair; color dark brown; size smaller and rather more slender in form than *californicum*. Length 0.6 mm.; width 0.25 mm. Florida.....*elongatum* Lec.

Elongatum was described as an *Orthoperus* by LeConte, and the type is not before me at present, but a drawing from this type made by me some years ago seems to show that the prothorax differs so greatly in outline from that of *californicum* as to indicate some divergence of a generic nature.

In the recent posthumous "Monograph of the Corylophidæ and Sphæriidæ," page 35, Mr. Matthews has fallen into a singular misapprehension, as my letter to him will undoubtedly show. My language was not by any means intended to imply that his *Ænigmaticum ptilioides* was identical with *Orthoperus elongatus*, but simply stated my conviction that the *elongatus* of LeConte is an *Ænigmaticum*. There

are many minor errors throughout this important monograph, which would doubtless have been avoided had the author lived to conduct it through the press. *Sphærius politus*, for example, on page 214, is attributed to the author as a new species, whereas it was in reality described by Dr. Horn many years ago.

CRYPTOPHAGIDÆ.

Under this name have been grouped two closely allied types of so-called Clavicornia, comprising numerous genera and species. The body is small to minute in size, oblong or oval, more or less convex and generally clothed with coarse subdecumbent pubescence, with additional longer and more erect hairs arranged serially on the elytra in many genera, similar to those of the Tritomidæ. The tarsi are pentamerous, becoming heteromerous in the males of certain genera as in certain Cucujidæ, and the anterior coxæ are oval, moderate in size, smaller and more deep-set than in Tritomidæ, becoming decidedly transverse in the Ephistemini, and having an external trochantin. It is this form of the coxæ which principally distinguishes the family from the Cucujidæ, where the anterior coxæ are still smaller, equally or still more deeply inserted and subglobular. The family is also unmistakably allied in many characters, especially evident in the Atomariinæ, to the Scydmaenidæ. Among these resemblances may be mentioned the basal impressions of the pronotum, so characteristic of the Cryptophaginæ, the side margins of the latter in *Cenoscelis*, and the recurved ventral sutures of that and some other genera, the elongate form of the trochanters, alternating long and short joints of the antennal shaft and slender pentamerous tarsi. The only serricorn character which is especially evident is the asymmetric antennal club of *Ephistemus*.

Probably the most essentially peculiar structural feature of the Cryptophagidæ, although a distinguishing character of the Silvaninæ as well, is the modification of the lateral edges of the prothorax by serratures or nodular thickenings, and the various forms assumed afford excellent subsidiary criteria for the definition of genera. Another peculiarity is the narrow and feeble dehiscence of the elytra at or very near the apex, there being but few genera, such as *Diplocalus* and *Loberus*, in which this character virtually disappears. The eyes are rounded and convex, usually rather well developed and coarsely faceted, but somewhat variably so. The antennæ are always 11-

jointed, with a loose club which is generally 3-jointed, but sometimes purely 2-jointed, and, in one case—*Anchorius*—4-jointed, a character remindful of Tritomidæ. The anterior coxal cavities are generally widely open behind, but are completely and rather broadly closed in *Diplocælus*, completely but less broadly in *Cryptophilus*, narrowly but almost completely in *Haplolephus*, and about half closed in *Setaria*, proving that no useful generalization in the definition of the family can be drawn from the form of the cavities. The Biphyllini, as stated by Reitter, are evidently a perfectly natural part of the present family, this being proved by general organization, tarsal structure and especially by the radiating straight lines of the first ventral segment, also occurring in *Cryptophilus*, and, in an arcuate form, in *Tomarus*.* The tribe is quite out of place in the Tritomidæ, to which it was assigned by LeConte and Horn.

The Cryptophagidæ comprise two distinct subfamilies as shown by the following characters:—†

- Antennæ inserted under the acutely margined sides of the front and remotely separated at base, the palpi mutually dissimilar, the maxillary elongate and slender, with the fourth joint elongate and more or less acuminate toward the tip, the labial short, with the last joint enlarged, oval to securiform; pronotum generally bifoveolate at base.....CRYPTOPHAGINÆ
- Antennæ inserted on the front and more or less approximate at base, the palpi mutually similar, short, stout and acuminate, the last joint of both small, narrow and subuliform; trochanters always narrow and elongate, bearing the femora distally; pronotum never bifoveolate at base, though generally impressed; anterior coxal cavities always widely open behind, the tarsi invariably simple and filiform; eyes always basal, the first abdominal segment never having radiating lines.....ATOMARIINÆ

In tarsal structure these two subfamilies are linked together by way of the Cryptophagini and Cænoscellini. The insertion of the antennæ in *Anthrophagus* seems to suggest also a slight drift toward the Atomariinæ, but this is very feeble and more apparent than real. In the mode of antennal insertion, and especially in palpal structure, the two subfamilies are radically distinct; perhaps species may be discovered showing intermediate characters, but it is more probable that these bonds have long ago become extinct.

* These lines also occur in the subfamily Silvaninæ of the Cucujidæ.

† Names to which an asterisk is affixed apply to tribes or genera which do not occur within the limits of the American fauna as far as discovered.

CRYPTOPHAGINÆ.

The body in this subfamily is generally larger, more oblong, less convex and more pubescent than in the Atomariinæ, possessing at the same time much more variety in tarsal structure and in the form of the anterior coxal cavities. These variations are important, being always accompanied by a peculiarity of general structure and habitus, and necessitate the erection of a considerable number of distinct tribes as follows:—

- Trochanters moderate in size, very obliquely attached at the side of the femoral base, the latter attaining the coxæ; anterior coxal cavities completely and broadly closed behind; first ventral segment very much shorter than the next two combined, and having two fine straight cariniform lines diverging from the inner margin of the coxal cavities; antennal grooves before the eyes narrow and deep, the buccal processes narrow; front short and without trace of clypeal sutures; eyes basal and coarsely faceted; body subdepressed, the pronotum generally with fine longitudinal raised lines at least visible toward the sides; abdominal sutures fine, broadly arcuate; tarsi pentamerous in both sexes, the fourth joint small, the third strongly and the second more feebly, lobed beneath.....BIPHYLLINI.
- Trochanters very short but less obliquely joined to the femoral base throughout the width of the latter; anterior coxal cavities narrowly and partially closed behind by an inward projection of the side pieces of the prosternum; tarsi stout, pentamerous in both sexes, densely clothed beneath with coarse hairs, the fourth joint small; eyes basal or subbasal and coarsely faceted; front prolonged, more or less prominently convex above the antennæ and with a short oblique clypeal suture at each side; middle coxæ narrowly separated; pronotum never lineate, the basal foveæ minute or subobsolete; elytra with confused punctuation but becoming regularly seriato-punctate in *Leucohimatium*; basal segment of the abdomen short or moderate, never lineate, the sutures nearly straight; antennal grooves before the eyes narrow and deep in *Setaria*, obsolete in *Haplelophus* and *Leucohimatium*; antennal club 2-jointed in *Setaria*.....*SETARIINI.
- Trochanters elongate, bearing the femora obliquely attached distally; middle coxæ smaller and less narrowly separated; front short before the antennæ, without trace of clypeal sutures; antennal grooves obsolete; antennal club always loosely 3-jointed.....2
- 2—Anterior coxal cavities completely, though not very broadly, closed behind; first ventral segment but little longer than the second and with two straight diverging cariniform lines as in Biphyllini, the tarsi pentamerous in both sexes, with the fourth joint small, the joints toward base having simple brushes of hair beneath; first joint of the posterior as long as the next two combined in *Cryptophilus*; eyes basal and coarsely faceted; pronotal foveæ very minute.....*CRYPTOPHILINI.
- Anterior coxal cavities broadly and completely open behind; basal segment of the abdomen variable in length.....3
- 3—Tarsi pentamerous in both sexes, with the fourth joint small, the third joint strongly, and the second less strongly or obsoletely, lobed beneath, the lobes

narrow and pubescent; eyes always basal; first antennal joint relatively small; last joint of the labial palpi usually flattened, obtusely truncate or securiform; mesosternum flat or feebly concave between the coxæ; elytra with serial punctures in *Loberus*.....TELMATOPHILINI.
Tarsi always filiform, simple and never lobed beneath, pentameres in the females and heteromeres in the males, the penultimate joint similar in form to the preceding; last joint of the labial palpi oval, convex, narrowly truncate at tip; abdominal sutures straight throughout the width; prosternal process acute, freely passing over the mesosternum, which is generally concave; eyes variable; elytra never margined at base and never having distinctly serial punctuation.....CRYPTOPHAGINI.

The tribe Setariini is erected for three isolated European genera *Setaria*, *Haplophus* and *Leucohimatus*, and there is no American representative known thus far. The European genus *Cryptophilus* also necessitates the creation of a distinct tribe. All the other tribes are common to the two hemispheres.

BIBHYLLINI.

This is a small tribe, comprising a relatively large number of generic types. The body is oblong-oval or elongate-oval and generally notably depressed, pubescent and with the abdominal sutures very fine. The tarsi are pentamerous in both sexes, with the fourth joint small and simple, the fifth generally much elongated and the subbasal thicker and lobed beneath. The pronotum generally has some elevated longitudinal lines at least toward the sides; the scutellum is short and transverse and the antennæ rather short, with well developed club, very widely separated at base and inserted under the sides of the front, the basal joint moderate or small in size. The last joint of the maxillary palpi is slender, that of the labial large and securiform. The truncate posterior edge of the prosternum passes freely over the surface of the mesosternum, and the first ventral segment has two straight carinæ diverging from the middle of the base and extending to the apical margin or very nearly. The posterior sutures are flexed backward at the sides to a greater or less degree. The genera before me may be defined as follows:—

- Last joint of the labial palpi broadly oboval, thick and convex, with the apex broadly truncate and excavated; antennal club broad, oval, rather compact and 4-jointed, the eighth joint, however, very small, transverse and obtusely apical; pronotum longitudinally lineate throughout its width.....**Anchorius**
Last joint of the labial palpi broadly securiform and flattened, with the apical edge fine; pronotum only lineate toward the sides.....2

- 2—Antennal club 3-jointed, narrower and more loosely connected, the ninth joint sensibly smaller than the tenth, the eighth small and similar to the seventh, the last subtransversely oval and generally somewhat narrower than the tenth. [*Marginus* Lec.].....**Diplocælus**
- Antennal club 2-jointed, the eighth and ninth joints small and perfectly similar to the seventh, the tenth abruptly large, rectilinearly obconic in form and somewhat wider and longer than the eleventh, which is transversely suboval and obtusely pointed.....***Biphyllus**

In this tribe the joints of the antennal shaft are equal among themselves, showing little if any of the alternating inequality so prevalent elsewhere in the family.*

Anchorius, gen. nov.

In this genus the body is oblong-oval, rather depressed, the upper surface feebly and evenly convex. The legs are very much stouter than in *Diplocælus*, the femora broadly oval and the antennæ still shorter. The minute dense punctulation of the under surface is devoid of larger punctures, which is not the case in either *Diplocælus* or *Biphyllus*. There is but one species before me at present, which may be described as follows :—

Uniform dark brown throughout the upper surface, densely dull and devoid of lustre, extremely minutely and densely punctulate and minutely, densely pubescent; antennæ as long as the width of the head, the eyes large, convex and very coarsely faceted; prothorax twice as wide as long, with the sides moderately convergent from base to apex, evenly and distinctly arcuate, the apex broadly sinuate, with the angles bluntly rounded; basal angles obtuse but not obviously rounded; surface with ten fine and entire subelevated longitudinal lines, those toward the sides rather more widely spaced and somewhat more strongly elevated, the intervals feebly concave and with scattered coarser punctures; elytra one-half longer than wide, three times as long as the prothorax but not at all wider, the sides feebly arcuate, not continuous in curvature with those of the pronotum, evenly, rather strongly rounded behind; striae composed of unimpressed series of fine punctures, the intervals feebly elevated along the middle, the crest having a single series of short coarse and somewhat paler hairs, similar to those along the crests of the

* I follow DuVal in writing and adopting *Biphyllus* Stephens, instead of the emendation *Diphyllus* Redt. Lacordaire writes *Diphyllus*, with the statement that *Biphyllus* is inconsistent with the laws of etymology. This would be perfectly correct if generic words were subject to the laws of etymology—but they are not. They are simply pronounceable, and, first of all, constant, combinations of letters having latiniform endings. They cannot, when once established, be changed under any circumstances. They are not supposed to have a meaning—that is as an essential quality. Specific names, on the contrary, always have a meaning, and are therefore subject to the rules of etymology.

pronotal lines; under surface minutely, densely and evenly punctulate throughout, the surface somewhat shining. Length 3.3 mm.; width 1.4 mm. Arizona. **lineatus**, sp. nov.

In the type, the fourth ventral segment has a small and very shallow, transversely oval erosion at the middle and near the hind margin, the fifth much longer than the fourth, unmodified on the disk, and and very evenly rounded behind. This species is allied to the Cuban *Diplocælus costulatus* but differs in its larger size and in having ten, and not eight, longitudinal pronotal lines; it also seems to differ from the *mus* of Reitter, in the latter character.

Diplocælus Guér.

The species are few in number and are widely isolated structurally among themselves, in fact constituting several subgenera; they may be outlined as follows:—

- Prothorax parallel or feebly narrowing from base to apex, broadly, evenly convex, the basal angles not prominent but not at all rounded, the surface with three longitudinal elevated lines at each side, of which the inner is feeble and incomplete; eyes moderately coarsely faceted; elytra with very feebly impressed series of close-set punctures, the intervals each with a series of suberect hairs, which are short and inconspicuous,—becoming subobsolete in the European *humerosus*—brown or blackish in color, elongate-oval, feebly convex, feebly shining, minutely, closely punctured and densely pubescent, with coarse punctures interspersed on the pronotum, sterna and near the sides of the abdomen. Length 3.1 mm.; width 1.18 mm. Indiana. [**Diplocælus**, in sp.].....**brunneus** Lec.
- Prothorax subparallel and arcuate at the sides, finely serrulate as usual, the basal angles minutely prominent and acute, the surface convex and devoid of sublateral elevated lines except feeble traces, an arcuate excavated line at the apex and lateral fourth quite distinct; eyes very coarsely faceted; elytra pointed behind, having feebly impressed series of very coarse punctures, the intervals polished and with single series of very long erect setæ; general vestiture short and sparser, the surface strongly shining; sterna coarsely punctate, the abdomen finely, closely and evenly. Length 2.0–2.3 mm.; width 0.8–0.92 mm. Florida, Mississippi and Texas (Houston). [**Marginus** Lec.].....**rudis** Lec.
- Prothorax narrowed in front, the sides nearly straight, the hind angles prominent externally, covering the base of the elytra; surface coarsely punctured, with three elevated lines at each side, becoming subobliterated in front; elytra with series of coarse punctures, the single interstitial pubescent lines composed of short and coarser hairs. Length [3.25 mm.] Michigan. [Subgenus nov. ?]

angusticollis Horn

The last of these species is unknown to me, but the prominent basal angles of the prothorax seem to be foretold in *rudis*. *Brunneus* is a close derivative of the European *fagi*, but is more slender in form.

TELMATOPHILINI.

In this tribe the body is elongate-oval and convex, with slender antennæ, moderate in length and having a narrow loose 3-jointed club, with the ninth joint notably smaller than the tenth in *Telmatophilus* and *Loberus*, and subequal to the latter in *Tomarus*. The basal segment of the abdomen is only moderately elongate, and the elytral suture is margined. The pronotum has two small deep and widely separated isolated foveæ at the basal margin. The abdominal segments are perfectly mobile as in Cryptophagini, and the fourth tarsal joint is very small. The three genera differ considerably among themselves in general habitus and may be defined as follows:—

Elytra not margined at base, feebly margined along the suture, the surface pubescent and closely and irregularly punctured; prosternal process acute at tip; eyes well developed and coarsely faceted; tarsi thick and strongly lobed and pubescent beneath, the basal joint of the posterior not much longer than the second, the claws thick and strongly arcuate but not obviously dentate; abdominal sutures flexed abruptly backward at the extreme sides, the first segment as long as the next two combined or longer; pronotum having a very fine excavated line along the marginal basal bead throughout the width.....**Telmatophilus**

Elytra with a thickened basal marginal bead, along which there are several small deep foveæ in *Tomarus*, the suture finely and more or less strongly margined throughout; prosternal process truncate at tip; abdominal sutures straight throughout, the basal segment shorter; body sparsely and feebly pubescent to glabrous.....2

2—Pronotum broadly but feebly impressed at base between the foveæ, the elytra evenly striato-punctate; eyes large, convex and very coarsely faceted; tarsi thicker, strongly lobed, the basal joint of the posterior but little longer than the second, the claws dentate within at base; first abdominal segment without diverging lines; segments one to four decreasing gradually and but slightly in length.

Loberus

Pronotum not impressed at base, the elytral punctures sparse and irregular in distribution; eyes rather small and not very coarsely faceted; tarsi very slender, feebly lobed and only on the third joint, the first joint of the posterior nearly as long as the next three combined, the claws very slender, arcuate and perfectly simple; first abdominal segment with two very widely diverging arcuate lines, homologous with the straight and less diverging lines of Biphylini and Cryptophilini.....**Tomarus**

No representative has as yet been discovered in the Pacific coast fauna, but the tribe is much better developed in America than in Europe. *Cryptophilus*, which is placed near *Telmatophilus* by Reitter, is entirely out of place, the completely closed anterior coxal cavities betraying a greater affinity with *Diplocelus*.

Telmatophilus *Heer.*

This genus is widely extended in range through all the palaearctic and nearctic provinces, but has not yet occurred on the Pacific coast of America. We have but one species, as follows:—

Piceous-black, rather shining, densely and deeply but finely punctured throughout above and beneath, the pubescence short, ashy, the elytra in addition with imperfect single series of slightly longer hairs; antennæ and legs rufous, the former scarcely as long as the head and prothorax; eyes convex and prominent; prothorax barely two-fifths wider than long, the sides parallel, evenly arcuate, the edges finely serrulate and single; apex broadly arcuate and as wide as the base, which is broadly bisinuate; basal angles acute, the apical obtusely rounded; disk feebly convex, finely and very densely punctate; elytra but little wider than the prothorax in the male, and less than three times as long, relatively larger in the female, obtusely rounded at tip, the humeri not exposed at base; punctures not coarser and much less dense than those of the pronotum; legs stout. Length 2.4–2.7 mm.; width 0.9–1.0 mm. Canada, Massachusetts, New York, Iowa and Colorado (*Greeley*).....**americanus** *Lec.*

The male is a little shorter and stouter than the female and has a deep oval pit at the apex of the fifth ventral segment, and the hind tibiæ strongly dentate externally near the base; the mesosternum is very feebly concave between the coxæ. The European *caricis*, which resembles *americanus* very closely, has a very feeble impression at the middle of the fifth ventral of the male, and the hind tibiæ of that sex are much more feebly and obtusely swollen externally near the base.

Loberus *Lec.*

This genus appears to be exclusively American and will prove to be tolerably rich in species. The resemblance to certain crepidoderid Chrysomelidæ has been alluded to by LeConte and Horn, and is sufficiently striking, the body is however narrower than in the great majority of Crepidoderæ. The broad and shallow transverse depression extends between the pronotal foveæ but is semi-independent of them. The species before me may be defined as follows:—

- Basal depression of the pronotum broadly impressed and transverse, almost adjacent to the basal margin; elytral margins very narrow and equal.....2
 Basal depression more deeply and acutely impressed and somewhat anteriorly arcuate, being more distant from the basal margin on the median line; elytral margins more broadly reflexo-explanate at basal third.....4
 2—Punctures of the elytral series rather coarse, each bearing a moderately long and very distinct recurved silvery hair, the intervals glabrous and impunctate. Body elongate-oval, convex, polished, dark rufo-testaceous to blackish in color, the head and pronotum sparsely pubescent; antennæ testaceous, with the club

darker, extending slightly beyond the base of the prothorax, the latter very slightly narrower than the elytra in the male, more distinctly so in the female, nearly twice as wide as long, the sides parallel and feebly arcuate, abruptly sinuato-convergent near the base, the basal angles right and not blunt, the apical obtusely rounded, the base broadly bisinuate; punctures sparse and rather coarse; elytra fully three and one-half times as long as the prothorax, parallel and broadly arcuate at the sides, the apex rather narrowly rounded; humeri somewhat exposed at base; disk more or less impressed at the suture on the posterior declivity before the apex. Length 1.8-1.9 mm.; width 0.75-0.8 mm. Middle States and Rhode Island (Boston Neck).....**impressus** Lec.

Punctures of the elytral series each bearing an infinitesimal hair only visible under great amplification, the surface throughout polished and apparently perfectly glabrous; antennae and prothorax similar to those of *impressus*, the elytra similarly between three and four times as long as the prothorax, narrowly rounded at apex and with somewhat basally exposed humeri.....3

3—Body dark rufous or rufo-piceous in color, the punctures of the head and prothorax fine and very sparse, the superciliary ridges fine and scarcely at all flexed inward anteriorly; elytral series scarcely at all impressed, the punctures more or less small in size. Length 1.9-2.1 mm.; width 0.78-0.8 mm. New Jersey.

subglaber, sp. nov.

Body black or blackish in color, the punctures of the head and prothorax coarse but sparse, the superciliary ridges coarse and strongly bent inward anteriorly; elytral series sensibly impressed, the punctures coarse and deep. Length 1.8 mm.; width 0.75 mm. Florida.....**imbellis**, sp. nov.

Body rufo-testaceous in color, smaller and more slender in form; superciliary ridges very fine, feeble and not flexed inward at their anterior end; punctures of the head and pronotum fine but deep and very sparse; elytral series not or scarcely at all impressed, the punctures fine but distinct. Length 1.6-1.75 mm.; width 0.65-0.7 mm. Bahamas (Egg Island) and Cuba (Bahia Honda).

insularis, sp. nov.

4—Body elongate-elliptical, rather less convex, the elytra more strongly narrowed behind from about the middle, polished, blackish-piceous in color, the elytral humeri and apical fourth testaceous; antennae, head and prothorax nearly as in *impressus*, the latter sparsely clothed with longer pubescence, finely and rather less sparsely punctate and much less declivous toward the sides; elytra quite distinctly wider at or just before the middle than at base; slightly wider than the prothorax and nearly four times as long, subacute at apex, the humeri but slightly exposed at base, the series unimpressed, composed of rather small but distinct punctures, the intervals also with uneven series of smaller, still more widely spaced punctures, all the punctures bearing distinct subdecumbent hairs, the entire surface being sparsely pubescent. Length 2.0 mm.; width 0.9 mm. Mexico (Frontera in Tabasco). Prof. C. H. T. Townsend.

puberulus, sp. nov.

The lateral edges of the prothorax in all the species are distinctly thickened and bear a few very minute widely spaced serrules, one behind the apex being especially constant; the thickened margin is

flexed inward for a short distance at the apical angles, and, along the base, forms a margin which becomes very feeble or obsolete along the broad median lobe. The only species in which sexual characters are noticeable is *impressus*, and here the male has a very minute shallow fovea, accompanied by a tuft of loose longer hairs, at each side of the median line and near the middle of the length of abdominal segments two, three and four.

Tomarus Lec.

The body in this genus is smaller and relatively shorter than in *Loberus*, and has a markedly different general habitus. The lateral edges of the prothorax are very finely double, the outer edge more or less distinctly and unevenly undulated, the border flexed inward for a short distance at apex, and, at base, as far as the foveæ, where the margin becomes very fine along the basal lobe. There is a fine superciliary ridge as in *Loberus*, but the antennæ differ in having the basal joint of the club about as large as the second. I have not noticed any distinctive sexual characters in the male. The three following are the only species known to me at present :—

Body subglabrous, the head and pronotum clothed sparsely with very short subdecumbent hairs, the elytra glabrous, each with three discal and one marginal series of very widely spaced erect setæ; sides of the prothorax very obsoletely undulated2

Body clothed throughout with coarse, sparse, subdecumbent hairs in addition to the series of elytral setæ; sides of the prothorax more strongly and quite distinctly undulated.....3

2—Body rather narrowly oval, convex, polished, the anterior part feebly alutaceous, flavo-testaceous to blackish throughout, the elytra broadly, suffusedly paler toward the humeri and in a transverse band interrupted at the suture, near apical third; antennæ but little longer than the head and prothorax, the club well developed; head and pronotum finely but strongly, rather closely punctured, the punctures finer toward the sides of the latter, which is three-fifths to two-thirds wider than long and much narrower than the elytra, with the sides parallel and arcuate and the apex very nearly as wide as the base; elytra two and two-thirds to three times as long as the prothorax, subinflated and widest at two-fifths, gradually narrowed to the acute apex, the humeri feebly denticulate externally and obliquely exposed at base; erect setæ, moderately long and distinct, the punctures fine and sparse, with series of rounded areolæ shining through the translucent chitin from the under surface. Length 1.25–1.6 mm.; width 0.65–0.72 mm. New York and Rhode Island to Iowa and Mississippi.....**pulchellus Lec.**

Body and antennæ nearly similar to the preceding, the former rather shorter and less acute behind, pale flavo-testaceous in color, the head and pronotum more alutaceous, the elytra polished and almost similarly maculate, with the erect setæ very

short, those of the discal series extremely short and almost obsolete; head and pronotum finely and feebly punctate, the latter shorter and more transverse, almost twice as wide as long, the sides similarly parallel and arcuate, the feeble punctures becoming almost completely obsolete toward the sides; elytra nearly similar to those of *pulchellus* but shorter and more obtuse, three times as long as the prothorax and distinctly wider, the punctures sparse and very fine. Length 1.2 mm.; width 0.59 mm. Arizona (Tucson).....**obsoletus**, sp. nov.

- 3—Body smaller, shorter and more broadly oval than in the preceding, convex, polished, dark rufous, the elytra black, pale in the basal regions and broadly at apex, except transversely at apical fourth; antennæ longer than the head and prothorax, the latter short and strongly transverse, finely and sparsely but strongly punctate, the sides parallel and arcuate; elytra short, but little longer than wide, ogival at apex, coarsely, rather closely and conspicuously punctured. Length 1.0–1.1 mm.; width 0.5–0.55 mm. Florida (Tampa)..**hirtellus** Schz.

A small specimen from North Carolina may possibly represent a distinct species or subspecies of *pulchellus*; it is smaller, more obtuse behind and somewhat differently colored. The strong basal margin of the elytra enclosing a series of foveæ along its posterior edge, is a marked feature of this genus and it is this which causes the minute denticulation of the elytral humeri mentioned above.

CRYPTOPHAGINI.

This tribe differs from all those which precede primarily and very radically in the structure of the tarsi, which, instead of being shorter and stout, frequently lobed beneath, with the fourth joint very small and pentamerous in both sexes, are here more or less slender and fili-form, never lobed beneath, with the fourth joint similar to the preceding and pentamerous in the females and heteromerous in the males, as in the *Cænoscellini* of the next subfamily. From the *Telmatophilini* they differ besides, as a rule, in a coarser and denser sculpture and vestiture, stouter antennæ, with less loosely connected club and less coarsely faceted eyes than in *Telmatophilus* and *Loberus*. The first segment of the abdomen is usually more elongate, being subequal to the next two combined, and never has diverging lines; the sutures are straight throughout the width, differing in this respect from *Cænoscellis*. The genera are rather numerous, those before me being readily recognizable by the following characters:—

Eyes ante-basal, small, rather finely faceted and not prominent; frontal margin deeply emarginate and impressed at the middle, especially in the male, the front not at all prolonged beyond the antennæ, the basal joint of the latter large and globular, the second similar to the third and following, the club rather feebly de-

- finer in the male but parallel and loosely 3-jointed as usual; pronotum not impressed but finely, strongly margined at base, the foveæ minute and almost completely obsolete, the sides even, with a rather thick margin, which becomes gradually very thick at the apical angles but continuously so, the apical callus not posteriorly delimited or truncated—as it is in *Cryptophagus*; elytral suture margined except toward base; mesosternum rather more concave between the coxæ than usual, the tibiae compressed and somewhat triangular, the tarsi and claws slender as usual. [Subtribe ANTHEROPHAGI].....**Anthrophagus**
- Eyes basal, convex, prominent and more or less coarsely faceted; tibiae slender.....2
- 2—Front declivous and concave between the antennæ, the edge not beaded over the insertion of the latter.....3
- Front declivous but evenly, longitudinally convex anteriorly, the edge sharply angulate but not beaded over the antennæ, the frontal margin with a broadly, posteriorly angulate smooth space, probably homologous with the emargination of *Anthrophagus*; antennæ moderate, the club loosely 3-jointed, with the last joint obliquely and obtusely narrowed from near the base, the first joint small and globular; prothorax with a broad flat marginal bead at base, before which the surface throughout is feebly impressed, the foveæ wholly obsolete; sides with a thickened nodal point at the apical angles but otherwise perfectly even, the nodal points projecting anteriorly, the apex broadly emarginate between them as in *Emphyllus*; punctures fine and irregular, the pubescence short, coarse and closely decumbent; subsutural lines of the elytra not extending to the base; mesosternum not at all impressed between the coxæ. [Subtribe SPANIOPHLENI.]
- ***Spaniophænus**
- Front flat and not more declivous anteriorly; antennal club normal and 3-jointed, its first joint not differing in form from the second though frequently smaller in size; body strongly punctured and rather coarsely pubescent. [Subtribe CRYPTOPHAGI]....4
- 3—Antennæ stout, almost similar to those of *Anthrophagus* but with the second joint wider than the third, the 3-jointed club narrow and feebly delimited, and with its basal joint smaller than the second though similar in form; prothorax not impressed at base, the sides even, with a fine acute edge, the apical angles broadly, obliquely truncate and prominent but only slightly thickened, the apex broadly sinuate between them, the basal foveæ and transverse impression obsolete; elytral suture margined toward tip; body subglabrous and strongly alutaceous, very finely, feebly and moderately closely punctured. [Subtribe EMPHYLLI].....**Emphyllus**
- Antennæ slender, the basal joint elongate-oval, not very thick, the second still narrower, elongate, broader than three to eight, which are very slender and elongate, the club narrow, loosely 3-jointed, gradually formed, the ninth joint being slender elongate and obconical, altogether dissimilar in form to the tenth and unique in the family; prothorax very feebly impressed transversely at base between the large but feeble foveiform depressions, the sides broadly and feebly triundulate, the edge thickened but not very prominent at the undulations, which are at the apex and near apical and basal third, the apical angles not modified, the apex broadly arcuate from side to side; elytral suture margined, very obsoletely so toward base; body coarsely sculptured and pubescent, nearly as in *Cryptophagi*. [Subtribe PARAMECOSOMÆ].....***Paramecosoma**

- 4—Prothorax triundulate at the sides—at the apex and near apical and basal third,—the undulations similar among themselves, the apical angles not more thickened ; elytral suture feebly margined toward tip.

Body short, broadly oval and convex, with long herissate vestiture, the prothorax finely bifoveate at base, the foveæ connected by a fine deep transverse impression, the disk also having a fine cariniform line at each side at some distance from the side margin and parallel thereto ; lateral undulations moderate in development, rounded and finely serrate ; eyes very small and extremely prominent.....**Crosimus**

Body elongate and less convex, clothed with denser, shorter and more decumbent pubescence as in *Cryptophagus*, the prothorax without a sublateral line, having two small basal foveæ connected by a very feeble and broadly impressed line, the lateral undulations simple but very prominent and denticiform ; eyes as in *Cryptophagus*.....**Salebius**

- Prothorax with thickened and obliquely truncate apical angles, the edge even, excepting a minute acute tooth at about the middle and sometimes minute serrulations thence to the basal angles, the basal foveæ very small and feeble, connected by a fine feeble impression along the basal margin, the apex truncate or feebly bisinuate ; elytral suture only margined posteriorly. [Subgen. *Mnionomus* Woll.]

Cryptophagus

- Prothorax with thickened and obliquely truncate apical angles, the edges thence evenly, feebly arcuate, slightly converging and evenly, finely serrulate to the base, the basal foveæ distinct and mutually connected by a larger deep basal impression ; elytral and other characters nearly as in *Cryptophagus*.....**Micrambe**

- Prothorax not thickened at the apical angles or undulated at the lateral edges, the latter perfectly even from apex to base and serrulate ; elytral suture margined very nearly to the scutellum

Body oval, convex, coarsely sculptured and pubescent, the prothorax with two small but deep basal foveæ connected by a very deep and conspicuous groove ; serrulation of the lateral edges more or less coarse and distinct.

Henoticus

Body oblong, parallel and strongly depressed, finely, more closely sculptured and pubescent, the prothorax with two very small but distinct basal foveæ, the connecting impression or groove wholly obsolete ; lateral edges very minutely serrulate.....**Pteryngium**

The definition of *Emphylus* is taken from the European *glaber*, and, as I have not seen the American representative—*americanus* Lec., of the catalogue,—the genus will not be further dwelt upon ; its affinity with *Antherophagus* is much more pronounced than with *Cryptophagus*, and the situation of the thoracic apex—due to the prominence of the apical angles—which has been hitherto advanced as a differential character, is one of the least important.

Antherophagus Latr.

This is one of the most isolated genera of the family and contains

by far the largest species, *Haplolephus* being the only other which approaches it in this respect. The emargination of the clypeus, very deep in the male but feeble in the female, is apparently a unique character in the family, and the antennæ are peculiarly thick and compact in the male, though bearing some resemblance to those of *Emphyus*; the female antennæ are much shorter, more slender and with relatively larger club. The eyes are almost without parallel in the family in their position upon the side of the head and in their relatively slight convexity, the convexity and prominence of these organs being one of the most characteristic features of the family. The body is oblong, rather convex, very finely, densely punctate and clothed, often densely, with very short subappressed pubescence. The elytra in some of the paler forms clearly show the regular series of areolæ on their under surface, shining through the diaphanous chitin and perhaps of significance in indicating that the family may be derived from seriately punctate archetypes; at present these series of areolæ are not connected in any way with the punctuation of the surface, which is altogether irregular, but there are frequently very feebly impressed superficial lines which appear on the exposed surface above them. The species are few in number and those in my cabinet may be thus characterized:—

- Body large, more broadly oblong, densely clothed with pubescence which nearly conceals the surface, the eyes smaller, the mandibles more prominent; tibiæ rapidly enlarged from base to apex; basal angles of the prothorax more or less obtuse... 2
- Body smaller, the sides of the prothorax parallel and straight, the basal angles right and not at all blunt; body smaller, the eyes moderately large, rather more convex and less finely faceted, the mandibles smaller and less prominent, the pubescence quite sparse, not at all concealing the surface; tibiæ but feebly enlarged from base to apex..... 3
- 2—Body broadly oblong, testaceous throughout, the antennæ of the male except at base and apex, and the tibiæ toward base, blackish; antennæ of the male thick, almost as long as the head and prothorax, the second joint much shorter than the third though equal in width; prothorax distinctly less than twice as wide as long, parallel and almost straight at the sides, but slightly rounding and convergent at apex and base, the punctures fine and dense; elytra not wider than the prothorax, a third longer than wide, obtuse at apex, very densely and finely punctate. Length 4.1–4.5 mm.; width 1.7–1.9 mm. New York to Minnesota.

ochraceus *Mch.*

- Body less broadly oblong and slightly smaller, equally densely but still more minutely punctate and densely clothed with short cinereous pubescence, pale flavo-testaceous, the tibiæ and antennæ colored as in *ochraceus*, the latter thick in the male and much shorter than the head and prothorax, the second joint equal in length

and width to the third; prothorax shorter, scarcely visibly less than twice as wide as long, the sides parallel and evenly, distinctly arcuate; elytra two-fifths longer than wide, not wider than the prothorax and less obtusely rounded at apex. Length 3.2-4.25 mm.; width 1.2-1.7 mm. Utah (southwestern)—Mr. Weidt.

pallidivestis, sp. nov.

- 3—Body narrowly oblong-oval, pale rufo-testaceous throughout, the antennæ and legs concolorous, polished, the elytra slightly alutaceous; antennæ moderate in the female; prothorax less than twice as wide as long, parallel and straight at the sides, finely but deeply, not very densely punctate; elytra subangularly dilated at two-fifths and wider than the prothorax, the base equal to that of the latter, the apex obtusely rounded; punctures very fine, feeble and rather sparse. Length 3.3 mm.; width 1.35 mm. Wisconsin (Bayfield)—Mr. Wickham

convexus Lec.

The stout mandibles are bifid at tip, and the antennæ are inserted within very small foveæ on the vertical sides at a great distance from the eyes; they differ very obviously in the sexes, as indicated above. *Suturalis* of Mäklin, I have not seen.

Crosimus, gen. nov.

In the general structure of the body this genus is allied to *Salebius*, and especially in possessing three lateral projections at each side of the prothorax, and in the same positions, but here the nodes are not thickened and take the form of broadly rounded and rather feeble undulations of the edge, the salients being spiculato-serrulate. It differs greatly from *Salebius* or *Cryptophagus* in the short stout, very convex and oval form of the body, long hirsute sparse vestiture, in having the elytral punctures arranged in uneven unimpressed double series, in having a fine raised line near each side of the pronotum extending from base to apex, and in the more longitudinally convex prosternum, the process being elevated far above the coxæ from an under view, the process more strongly margined at the sides; the antennæ, oral organs and legs are throughout as in *Cryptophagus*. The basal foveæ of the pronotum are connected by a very deep channel along the basal margin, which is never interrupted at the middle by a carina, and the callous discal spots of *Cryptophagus* appear to be obsolete. The tarsi are very slender and as long as in *Salebius*. The eyes are unusually small, absolutely basal and extremely convex, not very coarsely faceted. The two species before me may be described as follows:—

Body more narrowly oval, polished, black, the legs and antennæ testaceous, the elytra bright rufous, black at the apex, at the middle of the flanks and transversely behind the base near the suture; pubescence moderately long and sparse; prothorax

about two-thirds wider than long, the sides in general form nearly straight and strongly convergent from base to apex, continuing the sides of the elytra; punctures fine but deep and not very close-set, the surface shining; submarginal line rather feeble; elytra oval, before the middle much wider than the prothorax, scarcely three times as long as the latter, the punctures fine and sparse, the double series ill-defined. Length 1.6 mm.; width 0.78 mm. New York.

obesulus, sp. nov.

Body throughout in form and coloration as in *obesulus*, but a little stouter, the prothorax nearly four-fifths wider than long, with the sides feebly convergent, nearly straight in general form but not continuing the sides of the elytra, the surface less finely, very deeply and very closely punctate, the submarginal line parallel to the edge fine but strong; elytra nearly as in *obesulus* but more broadly oval and with more prominent humeral callus, the punctures larger and less sparse, the pubescence longer, more abundant and with very long erect subserial hairs in addition. Length 1.7 mm.; width 0.85 mm. Iowa (Iowa City)—Mr. Wickham.

hirtus, sp. nov.

These species are mutually very closely allied but appear to be distinct. The genus is probably confined to the Atlantic regions of the continent.

Salebius, gen. nov.

This genus, with *Crosimus*, is distinguished from *Cryptophagus* by having three subequal obtusely dentiform nodal points along each side of the prothorax—at the apex and near apical and basal fourth of the length, instead of a single nodal point, with a submedian spicule as in that genus. The node at the apical angles in *Salebius* is merely thickened, convex and more or less pubescent, but the two posterior often have a deep puncture at the middle of the summit analogous to the central puncture of the flattened apical node so prevalent in *Cryptophagus*. The tarsi are long and slender and nearly all the other anatomical structures are similar to those of *Cryptophagus*, except that only the anterior two of the pronotal callous spots are visible, and the impression along the basal margin is feebler, with the median carina always distinct. The five species in my cabinet may be recognized as follows:—

Punctures very fine but deep as usual, those of the pronotum very dense; body dark piceous, blackish beneath, the antennae and legs castaneous; pubescence short, even, decumbent and rather abundant, more distinct on the pronotum along the sides and median line; prothorax parallel and slightly rounded at the sides, not more than one-half wider than long; elytra two-thirds longer than wide, only slightly wider than the prothorax and fully three times as long, the punctures fine and rather close-set; hind tarsi nearly as long as the tibiae (♀). Length 2.4 mm.; width 0.9 mm. Queen Charlotte Islands (Massett)—Mr. Keen.

6-dentatus, sp. nov.

Punctures strong and moderately coarse more or less close-set on the pronotum.....2
 2—Tarsi moderately elongate, the posterior distinctly shorter than the tibiae in both sexes.....3

Tarsi more elongate, the posterior as long as the tibiae.....5

3—Eyes rather large and well developed, more than half as long as the head; body much stouter, dark rufo-testaceous throughout, the vestiture much longer though sparse; prothorax relatively small, three-fifths wider than long, parallel and nearly straight at the sides, the teeth very large, subacute and conspicuous; elytra large, parallel, evenly rounded behind, three-fifths longer than wide, fully a fourth wider than the prothorax and much more than three times as long, the punctures coarse and not very close-set (♀). Length 2.6 mm.; width 1.1 mm. California.....**minax**, sp. nov.

Eyes smaller but not more prominent, scarcely half as long as the head; body darker in coloration, the pubescence much shorter.....4

4—Body oblong-oval, moderately slender, shining, blackish-piceous in color, the legs paler; pubescence moderately short, coarse, somewhat abundant and distinct; prothorax rather strongly transverse, about two-thirds wider than long, strongly, densely punctate, parallel and broadly arcuate at the sides, the teeth well developed but less so than in *minax*; elytra elongate, two-thirds longer than wide, only slightly wider than the prothorax and more than three times as long, quite coarsely, but not very densely, punctate (♂). The female is larger but virtually similar in every way, the prothorax not relatively much smaller. Length 1.9–2.5 mm.; width 0.75–0.9 mm. California (Siskiyou and Sta. Cruz Cos.).

lictor, sp. nov.

Body nearly similar in form and coloration but less elongate, the prothorax large, much less transverse, barely one-half wider than long, the vestiture much shorter and inconspicuous, the sides parallel and evenly arcuate, the teeth pronounced; elytra shorter, three-fifths longer than wide, slightly wider than the prothorax and two and three-fourths times as long, the punctures decidedly less coarse and rather more close-set, the pubescence much shorter, even, decumbent and not very close (♂). Length 2.0 mm.; width 0.8 mm. California (Lake Tahoe).

montanus, sp. nov.

5—Body narrowly oval, rather depressed, shining, pale rufo-ferruginous throughout, almost similar in the sexes, the female larger; eyes rather small, not quite half as long as the head, the antennae moderate as usual; prothorax parallel and broadly arcuate at the sides, but little more than one-half wider than long, the teeth strongly developed and serriform; elytra three-fifths to two-thirds longer than wide, relatively a little broader in the female, rather coarsely, but not very densely, punctate, rather arcuate at the sides and narrowly rounded behind, slightly (♂) or distinctly (♀) wider than the prothorax and three times as long,—or slightly more in the female, the pubescence short, even, rather sparse and suberect. Length 1.75–2.3 mm.; width 0.7–0.85 mm. California (southern)—Mr. Fall.....**tarsalis**, sp. nov.

The species are sufficiently numerous and individually abundant on the Pacific coast, to which region the genus appears to be confined. I place here provisionally the Sitkan *Cryptophagus 8-dentatus* of

Mäklin, who states that the prothorax is quadridentate at each side; this would not apply to the *6-dentatus*, described above, unless the author included the basal angles and these are in no respect dentiform in the latter species.

Cryptophagus *Hbst.*

This is a large genus, including some of the larger and more conspicuous species of the family; they are easily separable among themselves but rather difficult to classify in a satisfactory manner. The body is oblong-oval, convex, strongly punctured and always coarsely, distinctly, though not densely, pubescent, the elytra having in addition some longer hairs, which are frequently very conspicuous and always subserial in arrangement, although the punctuation may, and usually does, exhibit no trace of series. The antennæ are moderate in length, thick, with the club abrupt, parallel and loosely 3-jointed. The prothorax is wider than long, subparallel anteriorly and narrowed toward base from about the middle, where there is a more or less distinct acute and reflexed marginal tooth, and the apical angles are thickened and obliquely truncate, the oval truncature sublateral, polished, generally flat or rarely concave and foveate at the middle; the lateral edges between the submedian denticle and the well-defined and sometimes subprominent basal angles is generally obsoletely serrulate; the disk is deeply, though finely, bifoveate at the base, the foveæ connected by a fine groove following the basal margin and often sub-interrupted at the middle by a fine longitudinal carina. There are also quite generally visible two small impunctate and feebly callus-like spots at each side near lateral third. The maxillary palpi are well developed, the last joint elongate and gradually, somewhat obliquely and obtusely acuminate, the last joint of the labial moderately stout, oval and truncate at tip, the mentum large, transverse, the basal parts concave and punctured and separated from the deflexed apical parts by a strong, transversely arcuate carina, which is prolonged anteriorly on the median line to the extreme apex. The anterior coxæ are obliquely oval, rather large and deep-set, and the intercoxal process is prolonged posteriorly, with its free tip ogivally acuminate and dorsally margined. The mesosternum is broadly and feebly concave. The tarsi are slender, and the abdominal segments two to four decrease gradually in length, the first longer, generally exceeding the next two combined, the fifth about as long as the second and rounded in both

sexes, the sutures transverse, perfectly free and virtually straight throughout. The elytra have sometimes—as in *plenus*—a smooth callous discal spot near the apex of each, which may be homologous with the smooth polished mirror-like sexual spots of the melyrid genus *Eurelymis*. Sexual differences in the form of the body are occasionally very pronounced, the male being shorter and stouter than the female, with relatively broader prothorax and shorter elytra.

The species before me may be tentatively characterized in the following manner:—

- Lateral spicule of the prothorax situated at or near the middle of the length; front not constricted between the antennae; species general in distribution.....2
- Lateral spicule situated far behind the middle, the sides just posterior to them frequently arcuately prominent; front narrowed by the very large antennal foveae. Pacific coast32
- 2—Sides of the prothorax broadly and conspicuously angulate at about the middle, the spicule at the apex thereby rendered more prominent and separated from the truncature of the anterior angles by a pronounced sinus.....3
- Sides of the prothorax in the form of a continuous and generally evenly arcuate curve, from the truncature of the apical angles to the base, the submedian spicule abruptly projecting from the limb and frequently extremely small.....15
- 3—Eyes large, generally one-half as long as the head or more; elytra finely and rather closely punctured.....4
- Eyes smaller but more strongly convex, always much less than one-half as long as the head.....6
- 4—Nodes of the thoracic angles very prominent and posteriorly unciform, the prothorax much wider anteriorly than at the middle, rather finely but deeply, densely punctate, the discal callous spots obsolete; elytra elongate, between three and four times as long as the prothorax. Length 1.9–2.5 mm.; width, 0.75–0.9 mm. Europe, Siberia and Northern America.....*acutangulus* Gyll.
- Nodes moderate in development, acute but not unciform posteriorly, the prothorax equally wide anteriorly and at the middle.....5
- 5—Pubescence long, coarse and very conspicuous, the serial hairs of the elytra distinct; elytra distinctly more than three times as long as the prothorax. Length 2.2–2.5 mm.; width 0.9–1.0 mm. Europe and Northern America.....*cellaris* Scop.
- Pubescence short and more decumbent, less coarse and very much less conspicuous, the serial hairs subobsolete; pronotum finely but deeply, only moderately densely punctate, the callous spots feeble; elytra more oval and less elongate, about three times as long as the prothorax. Length 1.9–2.1 mm.; width 0.8–0.85 mm. California.....*debilis* Lec.
- 6—Elytral punctures fine, the pubescence very short, inconspicuous and decumbent, the subserial hairs subobsolete or very short, the pronotal callous spots obsolete or scarcely traceable; nodes of the thoracic angles sharply truncated, the prothorax as wide at the middle as at the apex.....7

- Elytral punctures more or less coarse and much less close-set, frequently quite sparse, the surface strongly shining throughout; pronotal callous spots generally conspicuous.....8
- 7—Elytral punctures moderately close-set, the surface strongly shining; prothorax evenly convex, rather strongly and closely punctate, the nodes of the apical angles moderately prominent, much shorter than the sinus separating them from the median denticles; antennal club moderately broad; elytra two-thirds longer than wide. Length 2.1 mm.; width 0.8 mm. Alaska.....**bidentatus** Muhl.
- Elytral punctures extremely dense, the entire surface rather dull in lustre; prothorax less convex and more uneven, two-thirds wider than long, the truncated nodes large and more prominent, though not unciform behind, and but little shorter than the sinus between them and the denticles; elytra more than three times as long as the prothorax and a little wider, three-fourths longer than wide; antennal club well developed and rather broad. Length 2.3 mm.; width 0.88 mm. Colorado.....**confertus**, sp. nov.
- 8—Truncate node of the thoracic angles very large, though only moderately prominent, distinctly longer than the sinus separating it from the median spicules, the truncature elliptical, flat and sharply defined, the prothorax equally wide at apex—that is between the posterior angles of the truncatures—and at the middle, the median tooth short and broad, unciform posteriorly, the punctures rather coarse, deep as usual and only moderately close-set, the callous spots rather distinct, especially in the male; elytra much larger in the female than in the male, not wider than the prothorax in the latter; pubescence rather long but sparse, the subserial hairs long, suberect and conspicuous. Length 2.3–2.7 mm.; width 0.9–1.15 mm. New Jersey.....**nodifer**, sp. nov.
- Truncate node of the thoracic angles rather small, always much shorter than the sinus separating it from the denticles, the truncature narrow, convex and very acute posteriorly.....9
- 9—Elytra rather oblong-oval, more elongate and less strongly rounded at the sides, never more than slightly wider than the prothorax.....10
- Elytra oval, relatively more convex, more narrowly rounded behind and always very much wider than the prothorax.....14
- 10—Node of the thoracic angles very small and not acute or angulate posteriorly from a vertical viewpoint; body pale ferruginous throughout; prothorax rather finely but deeply, only moderately closely punctate, a little narrower at apex than at the middle, the callous spots large and conspicuous, though not much elevated; elytra only moderately coarsely and rather sparsely punctate; pubescence long, coarse and conspicuous throughout, pale ochreo-cinereous in color (♀). Length 2.3 mm.; width 1.0 mm. Indiana?.....**parvinoda**, sp. nov.
- Node of the thoracic angles better developed, with the posterior extremity very acutely prominent and unciform from a vertical point of view, the prothorax subequally wide at the middle and apex.....11
- 11—Pubescence moderately long and suberect, sparse.....12
- Pubescence short and more closely decumbent, even, the longer hairs subobsolete.....13
- 12—Body blackish-piceous in color, the pronotum rather paler and the elytra dark testaceous; pronotum evenly convex, rather coarsely and closely punctured, the callous spots very distinct, rather small and scarcely elevated; elytra about two-

- thirds longer than wide, broadly rounded behind, coarsely and unusually sparsely punctate (♀). Length 2.45 mm.; width 1.00. Pennsylvania (Westmoreland Co.).....**infuscatus**, sp. nov.
- Body nearly as in *infuscatus* but smaller and rather less elongate, pale rufo-ferruginous in color throughout, the elytra rather more strongly narrowed and less broadly rounded behind, similarly sculptured but with the antennal club shorter and relatively broader and more compact (♀). Length 2.25 mm.; width 0.9 mm. District of Columbia.....**plettrum**, sp. nov.
- 13—Body parallel, rufo-ferruginous throughout, the prothorax large, three-fifths wider than long, fully as wide as the elytra, strongly, moderately densely punctured, the callous spots small but very conspicuous and distinctly elevated; elytra three-fifths longer than wide, rather abruptly and very obtusely rounded behind, the punctures coarse and rather sparse, but much closer and rather more perforate than in the two preceding species (♂). Length 2.4 mm.; width 0.95 mm. New York—Mr. H. H. Smith.....**cicatricosus**, sp. nov.
- 14—Prothorax as wide at the apex as at the middle; body pale flavo-testaceous in color throughout, the pubescence long, erect and hispid, very conspicuous though unusually sparse; prothorax small, transverse, strongly, but not very coarsely or closely punctured, the callous spots all very distinct; elytra oval, just before the middle nearly two-fifths wider than the prothorax, the punctures very coarse, deep and sparse, but, as usual, small or obsolete toward apex, each with an elongate callous median space near the tip (♀). Length 1.9 mm.; width 0.8 mm. North Carolina.....**politus**, sp. nov.
- Prothorax much narrower at the apex than at the middle; body broadly oval, strongly convex, highly polished, dark piceo-rufous in color throughout, the pubescence moderately long, sparse, coarse and ashy; pronotum evenly convex, not very densely punctate, the callous spots small and subobsolete; elytra inflated, scarcely one-half longer than wide, quite pointed at apex, the punctures very coarse, sparse and conspicuous toward the base and sides (♀). Length 1.85 mm.; width 0.8 mm. Lake Superior.....**difficilis**, sp. nov. (Lec. MS)
- 15—Truncature of the anterior thoracic angles forming a broadly oval, sharply defined, flat or feebly concave disk, having a large subcentral foveiform puncture, and from a vertical viewpoint, oblique and perfectly rectilinear.....16
- Truncature irregular, narrow, sometimes nearly flat but generally more or less convex.....25
- 16—Elytral pubescence semi-erect, the longer subserial hairs distinct and more or less bristling.....17
- Elytral pubescence short, decumbent and even, the longer subserial hairs almost or completely obsolete.....22
- 17—Species of the Atlantic coast; eyes small and strongly convex.....18
- Species of the Pacific coast, the eyes still smaller, extremely convex and subparabolic in outline from above.....21
- 18—Body very short and stout, not more than twice as long as wide, oblong, convex, blackish-piceous in color, the head, pronotum, antennæ and legs dark testaceous; prothorax large, very nearly as wide as the elytra, three-fifths wider than long, strongly and densely punctate, uneven, the callous elevations distinct; angular truncatures sensibly shorter than the distance thence to the spicules; elytra very

- short and obtusely rounded, less than one-half longer than wide, about two and one-half times as long as the prothorax, coarsely and rather closely punctate; pubescence rather long, suberect, coarse and bristling but not dense; antennal club moderate in development; each elytron has a large embosed rounded impunctate spot near the apex at inner two-fifths (♂). Length 2.0 mm.; width 1.0 mm. Florida..... **plenus**, sp. nov.
- Body more elongate, more than twice as long as wide, more or less pale ferruginous in color throughout.....19
- 19—Subserial setae of the elytra very long and conspicuous; body large, coarsely punctured, the elytra not very closely and sometimes sub-serially; sexual differences very marked, the male stout, with the antennae very thick, the elytra one-half longer than wide, but little wider than the prothorax and barely three times as long, the female much narrower and more elongate, with thinner antennae and smaller prothorax, having rather more prominent but otherwise similar angular nodes, the elytra three-fourths longer than wide, much more than three times as long as the prothorax and distinctly wider, the punctures somewhat more sparse and more inclined to serial arrangement; callous spots of the pronotum small but obvious; angular truncatures large but barely as long as the distance thence to the spicules. Length 2.6–2.7 mm.; width 1.1–1.2 mm. North Carolina. (Asheville)..... **amputatus**, sp. nov.
- Subserial setae only moderately distinct; body much smaller; angular nodes of the prothorax well developed but not prominent, the callous spots small but distinct; antennal club broad and well developed.....20
- 20—Body parallel, dark rufo-ferruginous in color, the pubescence rather abundant and conspicuous though only moderately long; prothorax scarcely narrower than the elytra in the male, distinctly narrower in the female, strongly and closely punctured, the angular nodes large and conspicuous, as long as the distance thence to the spicules, or even longer in the male; elytra, in the latter sex, one-half longer than wide, less than three times as long as the prothorax, coarsely and closely punctured, in the female decidedly more elongate, more than three times as long as the prothorax and less closely though equally coarsely, punctured; a feebly eroded adventitious second, line parallel to the posterior subsutural stria, is sometimes evident. Length 2.0–2.2 mm.; width 0.85 mm. South Carolina to Illinois; [*crinitus* Zimm.]..... **croceus** Zimm.
- Body more oval and rather more convex, pale flavo-ferruginous throughout; prothorax smaller and more rounded at the sides than in *croceus*, the angular lobes much smaller, distinctly shorter than the distance thence to the spicules, the punctures strong and rather close-set, the posterior callous spots more obvious than the anterior; elytra three-fifths longer than wide, rather strongly rounded at tip, about three times as long as the prothorax, the punctures only moderately coarse, deep, decidedly close-set and inclined to subserial arrangement, the pubescence shorter and less conspicuous than in *croceus* (♂). Length 1.9 mm.; width 0.75 mm. Pennsylvania (Westmoreland Co.)..... **laticlavus**, sp. nov.
- 21—Antennal club broader, with its basal joint scarcely smaller than the second as usual; body rather small, oblong, dark testaceous in color, the pubescence moderately long and sparse; prothorax very nearly as wide as the elytra, strongly transverse, three-fourths wider than long, strongly and closely punctured, the

callous spots feeble, the angular nodes well developed and as long as the interval thence to the spicules, which are very minute; elytra two-thirds longer than wide, more than three times as long as the prothorax, rather finely but deeply, not very closely punctate (♀). Length 2.0 mm.; width 0.88 mm. California (near San Francisco) **inscitus**, sp. nov.

Antennal club narrow, with its basal joint distinctly smaller than the second; body small, oblong, compact and convex, shining, dark rufo-testaceous in color, the vestiture rather long and abundant, suberect and distinct; prothorax large, about as wide as the elytra, strongly, very closely and deeply punctate cribrate, nearly even, the posterior of the callous spots alone distinct; sides parallel, very feebly narrowed at base, the angular nodes well developed and as long as the adjacent sinus, the spicules strong and distinct; elytra about three-fifths longer than wide and two and three-fourths times as long as the prothorax, not very coarsely, but deeply and quite closely, punctate (♂). Length 1.8 mm.; width 0.78 mm. California (Mokelumne Hill, Calaveras Co.)—Dr. Blaisdell.

cribricollis, sp. nov.

22—Body normally convex, pale ferruginous in color throughout, the nodes of the thoracic angles well developed but not prominent and not unguiculate behind. 23 Body sensibly depressed, blackish in color, the legs piceous, the head and pronotum rufo-piceous; thoracic nodes smaller but much more prominent, strongly acute and unciform behind 24

23—Body oblong-oval, rather stout, the antennal club moderately wide, with the middle joint just visibly the widest, the pubescence very short and even, somewhat sparse; eyes rather large and not very convex; prothorax well developed, the angular nodes moderate in size, not more than a fifth of the total length and very much shorter than the distance thence to the spicules, which are small but distinct, the sides between them and the nodes broadly sinuate; punctures close-set, the anterior callous spots small but abruptly elevated and very distinct, the posterior almost obsolete; elytra large, distinctly wider than the prothorax and more than three times as long, the punctures moderately coarse and somewhat close-set (♀). The male is shorter, with more finely and densely punctate prothorax and elytra. Length 2.0–2.4 mm.; width 0.88–1.0 mm. California (Sta. Cruz Co.) **brevipilis**, sp. nov.

Body nearly similar in form and color but with the eyes rather smaller and more convex, the thoracic lobes larger, about a fourth of the total length and but little shorter than the sides thence to the spicules, which portion is straight, the callous spots less distinct; elytra unusually finely and quite closely punctured; pubescence rather longer than in *brevipilis* but nearly even and decumbent (♀). Length 2.25 mm.; width 0.9 mm. California (exact locality not recorded).

lepidus, sp. nov.

24—Broadly oblong-oval, feebly shining, the antennal club moderate and the eyes quite small and strongly convex; prothorax relatively rather small but not very transverse, about three-fifths wider than long, unusually finely and very densely punctate, the callous spots very small and inconspicuous, the sides parallel, arcuately narrowing toward base, the spicules broad and truncate, unciform behind, the angular lobes rather small but very prominent, obliquely, rectilinearly truncate from above; elytra large, black, evenly rounded behind, nearly a fourth wider

than the prothorax and three and one-half times as long, rather finely but strongly, only moderately closely punctate, the pubescence very short, decumbent, even and sparse, with scarcely a trace of longer subserial hairs (♀). Length 2.6 mm.; width 1.0 mm. Lake Superior.—A male specimen from Siskiyou Co., California, is attached for the present and may belong to this species, as the differences presented are all in directions shown by other series to be sexual in origin.....**depressulus**, sp. nov.

- 25—Nodes of the thoracic angles small but very prominent, forming a narrow uneven convex surface sharply pointed behind; body rather narrow, elongate, moderately convex, black, the head and pronotum slightly piceous, the antennae and legs rufo-piceous; pubescence rather sparse, coarse, suberect, the subserial bristles long and distinct; eyes small, the antennal club moderate; prothorax not very transverse, one-half to three-fifths wider than long, not very coarsely but deeply and densely punctate, the callous spots subobsolete; median denticle short but rather broad, acute posteriorly, the sides thence moderately convergent and broadly arcuate to the base, the width across the denticles slightly greater than at the apical nodes; elytra elongate-oval, slightly wider than the prothorax and more than three times as long, the punctures moderately coarse, deep and not very close-set (♀). Length 2.3 mm.; width 0.83 mm. Utah (southwestern) and Colorado.....**porrectus**, sp. nov.

Nodes of the thoracic angles not notably prominent.....26

- 26—Antennae long, rather stout and unusually developed, about half as long as the body, the club moderate; eyes moderate; body quite short and stout, oblong-oval, pale rufo-ferruginous in color throughout, the pubescence conspicuously long, coarse, suberect and bristling, rather abundant and subeven; prothorax large, as wide as the elytra, three-fourths wider than long, evenly convex, coarsely, but not very closely, punctured, the callous spots subobsolete; nodes large, almost as long as the distance thence to the acute denticles, narrow and shining sublaterally; elytra one-half longer than wide, between two and three times as long as the prothorax, coarsely but not very closely and in part subserially, punctate, very minutely so toward apex (♂). Length 1.8 mm.; width 0.8 mm. Michigan.....**antennatus**, sp. nov.

Antennae much shorter, always much less than half as long as the body.....27

- 27—Eyes very small and strongly convex, scarcely a third as long as the head; body large, rather stout, elongate-oval, pale flavo-testaceous in color throughout, the pubescence only moderately long but suberect, very abundant and conspicuous, the subserial hairs but little longer and not very distinct; antennal club moderate; prothorax well developed, two-thirds to three-fourths wider than long, evenly convex, finely, deeply and closely punctured, the callous spots subobsolete, the sides parallel and evenly rounded from base to apex, the spicules very minute, the nodes well developed but narrow, polished, with a small central puncture; elytra elongate-oval, rather narrowly rounded behind, two-thirds longer than wide, obviously wider than the prothorax, the punctures fine and unusually close-set; male and female almost completely similar in form throughout, the former very slightly less stout. Length 2.6–2.9 mm.; width 1.05–1.2 mm. Pennsylvania (Westmoreland Co.)—Mr. Schmitt.....**valens**, sp. nov.

Eyes moderate in size and relatively less prominent, nearly half as long as the head., 28
 28—Nodes of the apical angles well developed and longitudinally convex, but little shorter than the distance thence to the spicules; antennal club unusually long and narrow, the last joint longer than wide; body rather large, narrowly elongate-oval, rather dark rufo-testaceous throughout, the pubescence somewhat short and moderately abundant but with the subserial setae quite long and obvious; prothorax moderately transverse, densely and deeply punctured, the callous spots small but rather distinct, the lateral spicules small; elytra unusually elongate, rather acutely ogival at apex, distinctly less elongate in the male, quite coarsely and deeply but not very closely punctured. Length 2.6–2.8 mm.; width 1.05 mm. Utah (southwestern)—Mr. Weidt.....**histicus**, sp. nov.

Nodes of the apical angles small, very much shorter than the distance separating them from the spicules.....29

29—Pubescence moderate in length and subdecumbent, the punctuation rather fine; body oblong, shining, dark testaceous throughout; prothorax well developed, moderately transverse, but little narrower than the elytra, the apical nodes extremely small, feeble, very oblique, narrow and convex sublaterally, with a minute posterior spicule; submedian spicule very minute, slightly behind the middle and separated from the nodes by between two and three times the length of the latter, punctures small but deep, moderately close-set, the callous spots small and rather feeble but distinct; elytra oval, rather obtusely rounded at tip, three-fifths longer than wide, the punctures rather fine but deep and not very close-set (♀). Length 2.2 mm.; width 0.9 mm. Indiana; [Carolina—Zimm.]

fungicola Zimm.

Pubescence long and bristling, the body coarsely punctured. Sonoran regions.....30
 30—Lateral spicules of the prothorax distinct and moderately large, the sides behind them thickened and laterally subprominent half the distance to the base, then sinuate to the angles; body rather stout, oval, convex, polished, piceous in color, the elytra blackish, nubilously paler at apex; prothorax moderately transverse, very coarsely, closely punctate, uneven, the callous spots large, conspicuous and unusually approximate longitudinally; apical nodes very oblique, spiculate behind; elytra oval, distinctly arcuate at the sides, moderately obtuse at apex, scarcely more than one-half longer than wide, and, at the middle, slightly wider than the prothorax, the punctures very coarse, deep and somewhat sparse, as usual very small toward tip (♀). Length 2.1 mm.; width 0.9 mm. Arizona (Tucson).....**discedens**, sp. nov.

Lateral spicules extremely minute and sometimes apparently obsolete, the sides behind them arcuately converging, sometimes sinuate very near the angles, in which case the latter are acutely prominent.....31

31—Narrowly oblong-oval, testaceous, the elytra frequently infusate; prothorax rather short and transverse and slightly narrower than the elytra in both sexes, the punctures moderately coarse, deep and somewhat close-set, the callous spots large and normally placed, the lateral edges rather widely reflexed; sides strongly convergent behind the middle; elytra more than three times as long as the prothorax in the female, much shorter in the male, rather narrowly obtuse behind, very coarsely, but only moderately closely, punctate. Length 1.9–2.0 mm.; width 0.78 mm. Utah (southwestern)—Mr. Weidt.

fumidulus, sp. nov.

- Rather broadly oblong-oval, flavo-testaceous throughout, otherwise similar to the preceding, except that the punctures are less coarse and more close-set, the sides of the pronotum more narrowly reflexed and the lateral spicules still more minute and frequently almost invisible; elytra broader and more broadly rounded behind (♀). Length 2.0 mm.; width 0.88 mm. California (southern): [*pileus*, *hirtulus* Lec.],.....**lecontei** Harold
- 32—Tarsi moderate in length, the posterior distinctly shorter than the tibiae in both sexes33
- Tarsi more elongate, the posterior fully as long as the tibiae in the male and but little shorter in the female; body oblong-oval, convex, shining, dark rufo-testaceous in color throughout; pubescence short, even, decumbent, yellowish, and not very dense; antennae slender, the club moderate, the second and third joints both elongate and longer than the first, which is subglobular; eyes moderate; prothorax well developed, one-half (♂) to three-fifths (♀) wider than long, nearly as wide as the elytra in both sexes, the nodes elongate-oval, flat and centrally punctate, the spicules small, the sides behind them prominently rounded and convergent; punctures moderately coarse, deep and dense, the callous spots visible; elytra nearly similar in the sexes, about three-fifths longer than wide, the punctures moderately coarse and not very close-set. Length 1.9–2.3 mm.; width 0.75–0.85 mm. Queen Charlotte Islands (Masset)—Mr. Keen.....**hebes**, sp. nov.
- 33—Body similar to that of *hebes* in form, sculpture and vestiture but smaller, with the prothorax more transverse and the antennae less elongate and relatively stouter, the third joint obviously shorter and more slender than the second; elytra three-fifths (♂) to two-thirds (♀) longer than wide, three times as long as the prothorax in the latter sex but much shorter relatively in the male, but little wider than the prothorax in either sex. Length 1.7–2.2 mm.; width 0.72–0.82 mm. California (Coast regions from Humboldt to San Diego).....**lyraticollis**, sp. nov.
- Body nearly similar to the two preceding in general form, but differing in the finer and closer punctures of the elytra, and, from *lyraticollis*, in the more slender and somewhat more elongate antennae, the club rather narrow, loose and parallel as usual; prothorax only moderately transverse, less so than in *lyraticollis* but otherwise nearly similar, the callous spots large and very distinct; elytra large, much wider than the prothorax and distinctly less than three times as long, one-half longer than wide (♀). Length 2.25 mm.; width 0.95 mm. California (Mendocino Co.).....**otiosus**, sp. nov.

I have been unable to identify the *♂-dentatus* of Mannerheim, from the Island of Sitka, or the Alaskan *tuberculosis*, *punctatissimus* and *♂-hamatus* of Mäklin. The last named must be very closely allied to *depressulus*, of the table, but differs somewhat in coloration, and especially in its much smaller size. I fail to identify the European *lap-tonicus* among our species, and the *nodulanguis* of Zimmerman, is also unrepresented in my cabinet. The *♂-dentatus* of Mäklin, is a *Salicibus* without much doubt, and the *californicus* of Mannerheim, belongs to the genus *Henoticus*. *Humeralis* of Kirby, was placed in *Triphyllus*

by LeConte, but in reality forms the type of a new Melandryid genus, which will be described further on in the present paper, and the *concolor* of the same author, I have been unable to trace.

Henoticus *Thoms.*

The general structure of the body, prosternum, legs and tarsi, trophi and antennæ are here almost precisely as in *Cryptophagus*, but the converging sides of the front above the antennæ are finely reflexo-marginate, and the structure of the sides of the prothorax wholly different, there being no trace of thickened nodal point, apical or otherwise; the edge is regularly spiculato-serrulate throughout, except for a short distance near the basal angles; it also differs in having the fine sub-sutural line entire or subentire. The deep groove near the basal margin of the pronotum connecting the conspicuous basal foveæ is similar to that of *Crosimus* and without trace of medial interrupting carina. The elytral punctures are arranged wholly without order, the pubescence short and the pronotum without trace of callous spots. The species known thus far are two in number, and are both very abundant in individuals; they may be outlined as follows:—

Black or blackish in color throughout when mature, the legs and antennæ paler, polished, oblong, convex and moderately stout in form, the pubescence short, very sparse, even and reclined; eyes well developed though scarcely half as long as the head; prothorax moderately transverse, the sides very nearly parallel, broadly and evenly arcuate, the serratures even and moderately developed, some eight to ten in number; punctures not coarse but deep, moderately close-set, the surface rather convex; elytra oblong, distinctly wider than the prothorax and three times as long or a little less, obtusely rounded behind, the punctures coarse and decidedly sparse. Length 1.7–2.1 mm.; width 0.65–0.85 mm. Entire northern America, Siberia and northern Europe. [*Paramecosoma denticulata* Lec.]

serratus *Cyll.*

Pale testaceous in color throughout, shining, the pubescence not quite so short, rather abundant and suberect, bristling with slightly longer hairs toward the sides; eyes small and extremely convex; prothorax strongly transverse, distinctly widest slightly before the base, the sides thence rather strongly convergent and straight and provided with some eight very strong, acute and equal serratures to the apex; surface feebly convex, more finely, rather closely punctate, evidently impressed near the lateral margins toward apex; elytra but little wider than the base of the prothorax and three times as long or more, very finely, though not very coarsely, punctate. Length 1.75–2.1 mm.; width 0.78–0.9 mm. California (San Francisco to Monterey).....**californicus** *Mann.*

The latter of these was assigned to *Cryptophagus* by its author. The *Paramecosoma inconspicua* Lec., i. litt., is unknown to me, but is probably founded upon a very small example of *serratus*.

Pteryngium *Reitt.*

Among the close allies of *Cryptophagus*, the two species of this genus may be instantly recognized by the rather narrow, strongly depressed and planulate body, with parallel sides, finely, densely punctured surface, short pubescence and entire subsutural lines. In this last feature, as well as the evenly arcuate and minutely, evenly serrulate sides of the prothorax, they resemble *Henoticus*, but differ in the depressed body and in the very minute basal foveæ of the pronotum, connected by a very fine and feeble basal groove, which is finely interrupted at the middle. In the structure of the legs, prosternum, trophi and antennæ they perfectly resemble *Cryptophagus*, but differ from that genus, as well as *Henoticus*, in the somewhat shorter and thicker tarsi, and especially in the much more elongate basal segment of the abdomen, this being as long as the next three combined; the sutures are free and perfectly straight throughout, as usual in the tribe. The frontal margin above the antennæ is very obsoletely and indistinctly margined. The species may be thus characterized:—

Body parallel, depressed, rather feebly shining, pale rufo-ferruginous throughout, the pubescence short, even, subdecumbent and rather abundant; eyes moderate in size and prominence, not very coarsely faceted, the antennæ scarcely as long as the head and prothorax, notably stout, the club parallel and broad, its first two joints equal and very strongly transverse, joints one to three rapidly decreasing in size; prothorax about one-half wider than long, the sides parallel, evenly, distinctly arcuate from base to apex and minutely, evenly serrulate, the apex broadly arcuate, the punctures fine but deep and very close-set; elytra but little more than one-half longer than wide, about equal in width to the prothorax and two and one-half times as long, parallel, obtusely rounded behind, finely but deeply, very closely punctate. Length 1.8 mm.; width 0.72 mm. Lake Superior and Europe.....**crenatum** *Gyll.*

Body similar in general form and coloration but smaller, narrower and more shining, the antennæ distinctly less stout, with the club less robust; prothorax similar in form but a little more transverse, finely, strongly punctured but only moderately closely, the surface more shining; elytra similar in general form but more elongate, scarcely wider than the prothorax but almost three times as long, the punctures fine, strong and rather close-set but much less dense than in *crenatum*, and, as in that species, having the surface broadly, transversely impressed at some distance behind the base, but here the impression bears traces of longitudinal striiform lines, which are wanting in *crenatum*; the pubescence, also, is still shorter, sparser and less evident throughout. Length 1.65 mm.; width 0.6 mm. Queen Charlotte Islands (Massett)—Mr. Keen.....**malacum**, sp. nov.

These two species are each represented before me by a single example in which the hind tarsi are 4-jointed. It is presumable, of

course, that the female has these tarsi 5 jointed. In each case the three basal joints are short, stout and equal and together scarcely longer than the last.

ATOMARIINÆ.

The genera of this subfamily may be readily recognized by the palpal structure and position of the antennæ, these organs being inserted upon the front and more or less approximate at base, the foveæ being either small and exposed or deep cavities, separated above by a short angular extension of the upper surface, and particularly developed in *Ctenoscelis* and *Sternodea*. The tarsi are always slender and filiform, as in the Cryptophagini, of the preceding subfamily, and, as in that case, there is frequently a feeble thickening of the anterior in the males. The body is much smaller as a rule than in the Cryptophaginae, and may be either narrow and parallel, as in *Agathengis*, or oval and more convex, as in the great majority of genera. The subfamily may be resolved into the four following rather widely differentiated tribes:—

- Prosternal process free, the tip passing over the flat or feebly concave surface of the mesosternum; antennæ free, the grooves before the eyes wholly obsolete, the club loosely 3-jointed; basal segment of the abdomen not modified behind the coxæ except in *Tisactia*.....2
- Prosternal process broader and flatter, generally prominent, forming a continuous surface with the mesosternum, its tip broadly arcuate and received closely within a corresponding depression at the apex of the mesosternum; body more compact, the prothorax more closely fitted to the elytra; buccal processes obsolete; elytra never margined at base; tarsi pentamerous3
- 2—Prosternal process prolonged and acute at tip, the mesosternum concave; prothorax with a double lateral margin; tarsi pentamerous in the female and heteromerous in the male; first abdominal segment well developed, longer than the next two combined, the sutures bent strongly backward for a short distance at the sides; antennal cavities large, narrowly separated; buccal processes long and prominent, the eyes very coarsely faceted; body elongate, only moderately convex, generally coarsely sculptured and sparsely pubescent.....CENOSCELINI
- Prosternal process shorter and truncate, the mesosternal surface generally flat; prothorax with a fine single lateral edge; tarsi pentamerous in both sexes; abdominal sutures straight throughout the width; antennal cavities small and superficial, the buccal processes extremely short and inconspicuous, the eyes much less coarsely faceted; body variable in form, sculpture and vestiture.....ATOMARIINI
- 3—Antennæ free, the club 2-jointed in *Sternodea*, the cavities very large and deep, contiguous; first ventral segment as long as the next three combined, without post-coxal plates, the sutures broadly, feebly reflexed toward the sides; prosternum extremely prominent along the middle, with acute lateral margins extending to the anterior margin; tibiæ feebly claviform; scutellum well developed and transverse; anterior coxæ almost rounded*STERNODEINI

Antennæ variable, the club loosely 3-jointed, the foveæ small, more widely separated on the front and superficial; eyes somewhat less coarsely faceted; basal segments of the abdomen relatively rather shorter and generally with a short and broadly arcuate post-coxal plate, the sutures straight throughout; prosternum broader and less prominent, the acute lateral margins not extending to the anterior margin; tibiæ slender, the scutellum very small; anterior coxæ transverse, the intermediate very widely separated; body broadly oval, convex and generally glabrous.....EPHISTEMINI

The Sternodeini are peculiar to the palaearctic provinces, but the other tribes are well represented in America, the Ephistemini, however, by no means so extensively as in Europe.

CÆNOSCELINI.

This tribe is composed at present of the single genus *Cænoscelis*, which is very well developed in the northern parts of America, and, to a less degree, apparently, in the palaearctic region; its species are the largest and most conspicuous of the subfamily, and compare very closely in this respect with *Cryptophagus*, but the body is narrower and more elongate as a rule.

Cænoscelis Thoms.

This is one of the best defined and more isolated genera of the family, distinguished by the elongate, strongly punctured and pubescent body, with double lateral margin and broadly impressed basal parts of the pronotum, convex, coarsely faceted and sparsely setulose eyes and well developed stout antennæ, with the basal joint unusually large and obconical, the second and third diminishing in size and four to eight still narrower and alternately shorter and longer, as usual in the Atomariinæ: the basal joint of the club is small, the last two well developed. The tarsi are very slender and the posterior are 5-jointed in the female and 4-jointed in the male, there being otherwise but little sexual disparity; the male is usually rather narrower, with relatively larger, and occasionally somewhat less transverse, prothorax. The prosternal process is narrower, the tip prolonged, free, concave toward tip and acuminate, the mesosternum being appreciably concave. The abdominal sutures differ greatly from the usual type and are strongly reflexed for a short distance at the sides, especially posteriorly. The American species appear to be far more numerous than the European as described thus far, and those before me may be outlined as follows:—

- Body ferruginous in color throughout.....2
- Body picceous-brown to black in color; pronotum broadly impressed at base, parallel and evenly distinctly arcuate at the sides9
- 2—Prothorax less transverse, never so much as one-half wider than long; body narrow and much elongated.....3
- Prothorax one-half or more wider than long, the body stouter and more oval in form.....8
- 3—Prothorax strongly arcuate at the sides, the pronotal punctures fine and close-set, the subbasal impression medial only.....4
- Prothorax feebly arcuate at the sides, the punctures coarse though generally close-set, the subbasal impression arcuate, deep and extending almost from side to side...5
- 4—Antennæ stout; the club robust and densely clothed with fine gray down-like pubescence, the joints increasing in size from the base and forming a gradual transition to the shaft; prothorax one-third wider than long, convex, the basal impression median and feeble, the sides evenly rounded, more convergent anteriorly, so that the apex is notably narrower than the base, the double margin narrow and feeble, not much more distinct toward base; elytra oval, two-thirds longer than wide, nearly two-fifths wider than the prothorax; body elongate-oval in form, the pubescence distinct, fine and sparse on the elytra, with the irregular series of longer hairs characterizing the genus. Length 1.8 mm.; width 0.7 mm. Alaska (Kenai).....**ferruginea** *Sahlb.*
- Antennæ much less stout, the club similar in structure but narrower; body narrower, more parallel and more depressed, the pubescence finer and rather denser, the prothorax one-third wider than long, less rounded at the sides, the apex not narrower than the base, the lateral margin and basal impression similar, the latter a little stronger; elytra a third or fourth wider than the prothorax, three-fourths longer than wide, closely and finely punctate. Length 1.7-1.75 mm.; width 0.55-0.65 mm. Colorado—Mr. Schmitt**ochreosa**, sp. nov.
- 5—Elytra finely and rather sparsely punctured.....6
- Elytra strongly and more closely punctured; body smaller, elongate-oval.....7
- 6—Body narrow and parallel, the elytra very feebly arcuate at the sides, fully four-fifths longer than wide and only slightly wider than the prothorax, the latter quadrate, but very slightly wider than long, the sides parallel, and evenly, feebly arcuate throughout, the apex scarcely narrower than the base, with prominent angles, the double edge slightly inflexed and notably wider toward base; antennæ moderate in length, the three basal joints well developed, the first as wide as the club, which is unusually narrow, sixth and eighth joints very small and subglobular, notably narrower than the fifth, seventh and ninth, the latter scarcely larger than the seventh, the club virtually 2-jointed (♂). Length 2.0 mm.; width 0.75 mm. Colorado.....**parallela**, sp. nov.
- Body similar in size, sculpture and color, but less parallel, the elytra not quite so elongate and more rounded at the sides, fully two-fifths wider than the prothorax, which is otherwise similar to that of *parallela*, but more distinctly wider than long, with the parallel sides a little more arcuate; antennæ similar but not so thick toward base, the first joint not so thick as the virtually 2-jointed club (♂). Length 2.1 mm.; width 0.8 mm. Locality not recorded.

angusticollis, sp. nov.

- 7—Antennae stout, the three decreasing basal joints moderate in development, four to eight globular and moniliform, ninth distinctly larger, obviously transverse, the club rather stout and notably wider than the first joint; prothorax one-third wider than long, the sides very slightly converging from base to apex, evenly and feebly arcuate, the apex quite distinctly narrower than the base; elytra fully three-fourths longer than wide, only slightly wider than the prothorax, the pubescence fine and short (♀). Length 1.8 mm.; width 0.63 mm. California (Si-si-ki-yoo Co.).....**shastanica**, sp. nov.
- Antennae more slender and rather longer, more than two-fifths as long as the body, relatively a little more thickened toward base, the first joint but little narrower than the last two, the ninth joint not wider than long, the club very small; prothorax more transverse, two-fifths wider than long, the sides parallel and very feebly arcuate, the apex scarcely narrower than the base, the double side margin more inflexed and wider toward base than in the preceding; elytra relatively much wider and more oval, two-thirds longer than wide, nearly two-fifths wider than the prothorax, the pubescence rather coarser and sparser (♀). Length 1.7–1.8 mm.; width 0.65–0.7 mm. New York and Pennsylvania.....**macilenta**, sp. nov.
- 8—Basal joint of the antennae unusually developed, one-half as long as the width of the head and subequal in width to the last two joints, eight to ten, increasing gradually in width, the ninth larger than usual when compared with the tenth, the latter only moderately transverse; prothorax one-half wider than long, the sides subparallel, evenly and rather strongly arcuate, the disk broadly impressed at base, as usual, and coarsely, deeply and closely punctured; elytra oval, narrowed and strongly rounded behind, strongly, but somewhat sparsely, subseriately punctate, much wider than the prothorax, the pubescence sparse and rather coarse, but subeven and not long. Length 2.2–2.25 mm.; width 0.8–0.83 mm. New York.....**basalis**, sp. nov.
- Basal joint of the antennae normally developed, much less than one-half as long as the width of the head, the club moderate; body smaller in size, the pronotum quite coarsely, deeply and closely punctate, as usual, three-fifths to two-thirds wider than long, parallel and strongly, evenly rounded at the sides; elytra about two-thirds longer than wide, oval, slightly narrowed behind, quite distinctly wider than the prothorax, rather coarsely, deeply but unusually sparsely, irregularly punctured, the pubescence rather long and coarse but sparse. Length 1.5–1.8 mm.; width 0.65–0.78 mm. South Carolina and Kentucky.....**testacea**, Zimm.
- 9—Body larger, the antennae more elongate, with joints four, six and eight longer than wide.....10
- Body small or moderate and relatively stouter, the antennae shorter, with the fourth, sixth and eighth joints not longer than wide; pronotum coarsely, deeply and more or less closely punctured, the elytra also strongly and more or less sparsely so.....12
- 10—Elytra inflated at the middle, fully two-fifths wider than the prothorax; body elongate-oval, rather convex, rufo-piceous, the elytra blackish; pubescence coarse, moderately long, sparse as usual; antennae moderately slender, distinctly less than one-half as long as the body, the club moderate, scarcely wider than the first joint, the ninth joint intermediate in width between the eighth and tenth,

the latter two-fifths wider than long ; prothorax two-fifths wider than long, rather strongly and closely punctured ; elytra three-fifths longer than wide, evenly oval, a little more than three times as long as the prothorax, rather finely but deeply, moderately closely and irregularly punctate (♀). Length 2.0 mm.; width 0.85 mm. North Carolina.....**ovipennis**, sp. nov.

Elytra not inflated and but little wider than the prothorax in either sex.....**II**

11—Antennæ slender, about half as long as the body, the basal joint moderately developed and not as long as the next two combined, the third unusually elongate, the club rather narrow though wider than the basal joint, the ninth not at all wider than long but intermediate in width between the eighth and tenth, the latter only slightly transverse ; prothorax scarcely two-fifths wider than long, closely and moderately coarsely punctured ; elytra about three times as long as the prothorax, rather finely but strongly, moderately closely, subseriately punctured, the vestiture as usual (♂). Length 2.25 mm.; width 0.85 mm. Kentucky.....**macra**, sp. nov.

Antennæ stout, not quite half as long as the body, the basal joint unusually developed, stout, fully as long as the next two combined, the third joint not unusually elongate and shorter than the second, the club rather stouter, the ninth joint slightly wider than long and the tenth more transverse ; prothorax shorter, more than one-half wider than long, strongly, but rather less densely, punctured ; elytra more than three times as long as the prothorax, rather finely but strongly, quite sparsely and irregularly punctured, the pubescence rather shorter and less coarse, a fifth wider than the prothorax in the male and a fourth in the female (♂ ♀). Length 1.8–2.1 mm.; width 0.75–0.82 mm. Pennsylvania (Westmoreland Co.)—Mr. Schmitt.....**elongata**, sp. nov.

12—Antennæ stout, the first joint rather well developed and subequal in length to the next two combined, the club moderate ; prothorax rather short and transverse, strongly rounded at the sides, three-fifths wider than long ; elytra slightly wider than the prothorax, elongate-oval in form, fully three-fourths longer than wide, the punctures rather sparse and moderately coarse ; body blackish-piceous in color (♀). Length 1.65–1.9 mm.; width 0.65–0.78 mm. (♂ ♀). Pennsylvania (Westmoreland Co.)—Mr. Schmitt.....**obscura**, sp. nov.

Antennæ and prothorax throughout nearly as in *obscura*, the body stouter in the female, the male slender, rufo-piceous in color, the elytra scarcely two-thirds longer than wide, more rapidly narrowed behind and relatively more narrowly rounded at tip, the punctures coarser and more conspicuous though equally sparse and likewise irregularly disposed (♀). Length 1.8–2.0 mm.; width 0.75–0.88 mm. (♂ ♀). Kentucky.....**subfuscata**, sp. nov.

Obscura is represented by a large series displaying but little variability, and four others of those described above are also present before me in numbers sufficient to demonstrate the constancy of most of the differential characters stated in the table ; the number of apparently valid species is however unexpected, and, as a rule, they are remarkable similar to each other in general habitus, which causes the taxonomic study of them to be unusually difficult and beset with doubt. *Testacea*

of Zimmermann, is omitted from the Henshaw list. The *cryptophaga* of Rietter, I have been unable to identify.

ATOMARIINI.

The Atomariini constitute by far the larger part of the subfamily, and comprise several genera in America. The body is much smaller throughout than in the preceding tribe and seldom or never surpasses 2 mm. in length. The genera before me may be briefly defined as follows:—

- Elytra not margined at base; body always pubescent, the antennæ separated at base by a third of the width of the head or less.....2
 Elytra margined at base; antennæ separated at base by nearly half the entire width of the head, though purely frontal as usual; body minute in size and virtually glabrous.....3
 2—Body elongate and parallel in form, less convex, the prothorax angulate and foveate at the lateral edges far behind the middle; antennæ very approximate at base, with the basal joint obconical and feebly arcuate; first ventral segment behind the coxæ not as long as the next two combined; prosternal process narrow.

Agathengis

Body oval, more convex, the prothorax rounded or angulate at or before the middle, and generally having the minute fovea, in the edge at the point of angulation, less developed than in *Agathengis*; antennæ less approximate at base, the basal joint shorter and oblong; first ventral segment behind the coxæ as long as the next two, the posterior segments shorter; prosternal process generally narrow and not prominent but becoming broader and more prominent in certain aberrant European forms, such as *cephennoides*.....**Atomaria**

- 3—Body oblong-oval, strongly convex, the prothorax rounded at the sides from above and not angulate, the edge minutely beaded and not foveate; first ventral as long as the next three combined, with a short feeble plate behind the inner part of the coxæ, becoming obsolete externally and gradually confounded with the coxal margin, the posterior segments short; prosternal process very wide, with acute lateral edges not attaining the apical margin, nearly as in *Ephistemus*.....**Tisactia**

The last of these genera is evidently a transition toward the Ephistemiini in some respects, but the scutellum is broadly oval as in the others, the body more loosely connected and the prosternal process evidently free and broadly, arcuately obtuse at tip. The basal margin of the elytra will isolate it at once from any other member of the subfamily known to me, causing it to bear somewhat the same relationship to the others, in that respect, as *Tomarus*, does in the Cryptophaginae.

Agathengis Gozis.

This aggregate of species, usually treated as a subgenus of *Atomaria*, satisfies the ordinary definition of a genus in having several constant

and purely characteristic structural characters, and is therefore valid. It differs from *Atomaria* in the characters stated in the table, and the habitual differences are such that it is seldom a matter of doubt as to the proper genus at the first glance. The body is elongate, generally quite slender and subparallel, convex and subuniformly, sparsely clothed with short and subdecumbent hairs, which become gradually still shorter in a sutural region near the elytral apex. The antennæ and eyes are moderately developed, the former generally rather stout, with more pronounced club than in *Atomaria*, and the joints of the shaft also very conspicuously alternating in length; the eyes are never very prominent and are not very coarsely faceted. The species are numerous in North America, relatively more so, apparently, than in Europe, where they are greatly outnumbered by *Atomaria*. Although easily separable by sight as a rule, they are even more homogeneous in adherence to a fixed type form than in *Atomaria*, and consequently form a difficult study for the taxonomist, as the differences are nearly all comparative. They seem to be quite local in distribution, judging from the material at hand excepting *crassula* which is common to the Atlantic and Rocky Mountain regions, and therefore fall very satisfactorily into primary geographic subdivisions as follows:—

Species of the Appalachian region and Great Lakes.....	2
Species of the Rocky Mountain system.....	6
Species of the Pacific Coast regions.....	15

- 2—Pronotum impressed at basal only in median half, the basal head bordered by coarse punctures, especially pronounced within the impression, the latter with clearly defined lateral limits; body small, elongate-oval, convex, polished, piceous, the elytra somewhat paler, the legs and antennæ flavo-testaceous; pubescence short and very sparse; prothorax slightly transverse, the sides broadly arcuate and feebly converging from basal fourth, narrowed at base, the punctures notably sparse and rather coarse; elytra about three-fifths longer than wide, somewhat prominently rounded and subinflated at the middle, then rapidly narrowed, the punctures sparse, strong and moderately coarse. Length 1.25–1.35 mm.; width 0.5–0.55 mm. Michigan..... **subnitens**, sp. nov.

- Pronotum more or less distinctly impressed along the basal margin throughout the width 3
- 3—Elytra variegated in color, red, a small post-cutellar transverse spot on the suture, a large entire fascia behind the middle, fainter toward the suture, and the apex, black, remainder deep black, the legs and antennæ testaceous; body small, elongate-oval, strongly convex, highly polished; antennæ well developed, half as long as the body; prothorax feebly transverse, nearly as in *subnitens*, finely but deeply, very sparsely punctate, the basal impression stronger toward the middle; elytra feebly though subprominently inflated at the middle, then rapidly narrowed to

- the apex, which is narrowly rounded, one-half longer than wide, coarsely, very sparsely punctate, the pubescence short and sparse, but coarse and distinct; prosternum distinctly carinate along the middle of the intercoxal portion. Length 1.4 mm.; width 0.55 mm. Pennsylvania..... **carinula**, sp. nov.
- Elytra virtually uniform in coloration; prosternum not, or only very feebly, carinate along the middle; elytral punctures fine and more or less close-set.....4
- 4—Antennae more elongate, fully half as long as the body in the male, the basal joint relatively longer and subequal to the next three combined; body small, narrow, parallel and less convex, the sides very feebly arcuate, piceous in color, the elytra paler and brownish-testaceous, generally still paler near, but not at, the apex, the pubescence very short but abundant; prothorax moderately transverse, subparallel, the sides distinctly and evenly arcuate from base to apex, the punctures fine and close set; elytra about two-thirds longer than wide, but little wider than the prothorax, not inflated at the middle, somewhat narrowly and parabolically rounded behind, finely and closely punctate. Length 1.25–1.5 mm.; width 0.5–0.6 mm. Massachusetts to Lake Superior and Iowa..... **pumilio**, sp. nov.
- Antennae less developed, much less than half as long as the body, the basal joint subequal in length to the next two combined; body more convex.....5
- 5—Body parallel and feebly arcuate at the sides, the prothorax well developed, black in color, the elytra piceous, the legs and antennae piceo-testaceous; pubescence short, moderately abundant but inconspicuous; prothorax a third to two-fifths wider than long, the sides just visibly convergent and broadly, evenly arcuate from the broadly rounded and margined basal angles to the apex, the punctures fine but deep and only moderately close-set; elytra elongate, three-fourths longer than wide, the sides rather more arcuate near the middle, moderately narrowed behind, at the middle a fourth to nearly a third wider than the prothorax, the punctures fine and moderately sparse; hypomera scarcely at all punctured. Length 1.78–2.0 mm.; width 0.72–0.76 mm. Michigan and Pennsylvania..... **patens**, sp. nov.
- Body decidedly obese, with relatively much smaller prothorax, similar in coloration, the pubescence still shorter and quite close; prothorax nearly one-half wider than long, the sides feebly converging from the rounded basal angles to the apex and very slightly sinuate just behind the middle, the punctures fine and close; elytra shorter, three-fifths longer than wide, nearly one-half wider than the prothorax, widest at or somewhat behind the middle but without trace of inflation, rather narrowly rounded behind, the punctures fine, only moderately close-set but rather less sparse than in *patens*; hypomera thickly punctured except at base. Length 1.65 mm.; width 0.75 mm. Pennsylvania (Westmoreland Co.) and North Carolina (Asheville)—the single specimen from the latter locality being wholly pale flavo-testaceous, probably from immaturity—and Colorado.
- crassula**, sp. nov.
- 6—Body dark in color, or with the head and prothorax darker than the elytra.....7
- Body rufo-testaceous in color throughout.....11
- 7—Pronotum impressed along the basal margin in about median half only, the hind angles slightly more than right but exceedingly well marked and not blunt.....8
- Pronotum impressed from side to side along the basal margin, the hind angles blunt, rounded or very obtuse.....9

8—Body regularly elongate-oval and strongly convex, black, the legs and elytra rufo-piceous; antennæ dark testaceous, the club unusually stout and deep black; pubescence short and not dense; basal joint of the antennæ unusually large and stout but of the usual form; prothorax barely two-fifths wider than long, the sides distinctly converging, broadly and almost evenly arcuate from base to apex and almost continuous with those of the elytra, the punctures fine and moderately close; elytra oval, two-thirds longer than wide, sensibly widest and feebly inflated before the middle, arcuately narrowed thence to the apex, which is rather narrowly rounded, the punctures very fine and quite sparse. Length 1.7 mm.; width 0.7 mm. Colorado.....**capitata**, sp. nov.

Body oblong, parallel and subdepressed, much larger, moderately shining, dark rufo-piceous throughout, the legs and antennæ but little paler; pubescence short but coarse and sparse, even as usual; antennæ moderate, the first two joints of the club transverse; prothorax unusually developed, parallel, but little wider than long, the sides feebly, almost evenly arcuate from base to apex; punctures fine but strong, moderately close, the basal impression very fine and shallow along the middle of the basal margin, elsewhere obsolete; elytra three-fourths longer than wide, but little wider than the prothorax, the sides broadly, feebly arcuate, gradually arcuato-convergent from about the middle, the apex somewhat broadly rounded; punctures very fine and relatively sparse, somewhat disposed to linear arrangement. Length 1.9 mm.; width 0.72 mm. Colorado—Mr. Schmitt.

quadricollis, sp. nov.

9—Sides of the prothorax distinctly sinuate behind the middle and prominent at basal third or fourth, the body, legs and antennæ pale pieco-testaceous in color, the head and pronotum darker piceous; pubescence very short and somewhat abundant; antennæ rather slender, the club moderate, sometimes dusky, its first two joints but slightly transverse; prothorax two-fifths or more wider than long, the sides arcuate and strongly converging at apex and base, the former slightly narrower, the punctures fine but strong and rather close-set; elytra oblong, two-thirds longer than wide, distinctly wider than the prothorax, narrowing gradually behind the middle (♂), or in apical two-fifths (♀), rather obtusely rounded at apex, the punctures fine but rather close. Length 1.7–1.85 mm.; width 0.7–0.8 mm. Colorado.....**constricta**, sp. nov.

Sides of the prothorax not or very obsoletely sinuate behind the middle; the body smaller and black throughout.....10

10—Antennal club shorter and broader, its first two joints strongly transverse; legs and antennæ rufo-piceous, the club of the latter blackish; pubescence moderately abundant and short but coarse and distinct; prothorax less than one-half wider than long, narrowing slightly only very near the base, the sides obviously converging, broadly and evenly arcuate thence to the apex; disk unusually tumid at the middle near the base and just before the impressed margin, the punctures rather fine but deep, close-set and conspicuous; elytra rather elongate, distinctly wider than the prothorax, parallel anteriorly, gradually narrowed behind the middle, moderately obtuse at tip, the punctures only moderately fine, deep, close-set and distinct. Length 1.65 mm.; width 0.65 mm. Colorado.

tenebrosa, sp. nov.

Antennal club larger, narrow, not darker in color, its first two joints not transverse; body shorter, the legs and antennae testaceous; prothorax strongly transverse, more than one-half wider than long, strongly narrowed in basal third or fourth, where the sides are very slightly prominent, thence feebly converging and broadly arcuate to the apex; disk not tumid in the middle subbasally, the basal impression very feeble throughout, the punctures fine and moderately close; elytra short, parallel, gradually rounding behind, about three-fifths longer than wide, rather distinctly wider than the prothorax, the punctures very fine and rather close, the pubescence very short but somewhat abundant. Length 1.45-1.55 mm.; width 0.65 mm. Colorado.....**coloradensis**, sp. nov.

11—Pronotum broadly, or deeply and very obviously, impressed at base.....12

Pronotum not impressed at base, or only with an extremely fine line extending along the basal bead; pubescence extremely short and moderately dense, the punctures fine; sides of the prothorax without trace of sinus behind the middle.....14

12—Sides of the prothorax distinctly sinuate for a short distance behind the middle and prominently rounded at basal third or fourth; body elongate-oval, moderately convex, pale rufo-testaceous throughout, the elytra more flavate, polished, the pubescence very short, sparse and inconspicuous; antennae moderate, about two-fifths as long as the body, with the club moderate, the first two joints moderately transverse (♂), or very short, stouter, with the club joints more transverse (♀); prothorax moderately transverse, strongly narrowed behind the lateral prominences, the apex not distinctly narrower than the base; disk finely, strongly somewhat closely punctate, the basal impression confined to median half of the width; elytra two-thirds longer than wide, gradually parabolically rounded toward apex, but little wider than the prothorax in either sex, the punctures fine but strong and rather sparse, sometimes inclined to serial arrangement. Length 1.6-1.9 mm.; width 0.65-0.75 mm. Idaho (Cœur d'Alène).....

stricticollis, sp. nov.

Sides of the prothorax without an obvious post-median sinus, rather strongly converging and broadly, almost evenly and strongly arcuate from base to apex; antennae moderate in length, rather slender, the club not stout; integuments shining.....13

13—Body narrowly oval, dark rufo-testaceous in color throughout; prothorax but slightly transverse, strongly, evenly convex, finely but strongly, sparsely punctate, the basal impression wide and strong, coarsely punctate and confined to the median regions; elytra three-fifths longer than wide, the sides parallel and evenly arcuate, slightly, though obviously, wider than the prothorax, rather narrowly rounded behind, finely and sparsely punctate, the pubescences sparse, moderately long and coarse and distinct. Length 1.3-1.6 mm.; width 0.55-0.65 mm. Colorado.....

lucida, sp. nov.

Body more broadly oval, equally convex, pale flavo-testaceous throughout; prothorax nearly one-half wider than long, evenly convex, finely and very sparsely punctate, the basal impression broader and more feeble than in *lucida* and stronger in median half or more, subobliterated toward the sides; elytra short, not more than one-half longer than wide, but little wider than the prothorax, narrowed behind from about the middle, the apex moderately obtuse; punctures very fine and sparse, the pubescence short, very sparse and inconspicuous. Length 1.5 mm.; width 0.68 mm. Arizona?.....**luculenta**, sp. nov.

- 14—Antennæ thick, moderate in length, the club unusually broad, with its first two joints distinctly transverse; body very elongate and moderately convex; prothorax moderately transverse, less than one-half wider than long, the sides distinctly converging and almost evenly, moderately arcuate from base to apex, the latter distinctly narrower than the base; disk feebly but almost evenly convex, finely but strongly, rather closely punctured, with a more or less distinct impunctate median line; elytra oblong, parallel, elongate, fully three-fourths longer than wide, only slightly wider than the prothorax, rather obtusely rounded in apical third, finely but distinctly, rather closely punctured. Length 1.7–1.8 mm.; width 0.62–0.65 mm. New Mexico (Coolidge) and Colorado.....**forticornis**, sp. nov.
- Antennæ slender, the club narrow, with its first two joints but little wider than long, moderate in length; body smaller and less elongate but similar in coloration and general characters to *forticornis*; prothorax rather strongly transverse, fully one-half wider than long, otherwise similar to *forticornis* but still more closely and more finely punctured; elytra three-fifths to two-thirds longer than wide, scarcely wider than the prothorax (♂) or distinctly so (♀), the punctures fine but strong and very close set, the pubescence very short but coarse. Length 1.5 mm.; width 0.55 mm. Arizona (Williams)—Mr. Wickham.....**macer**, sp. nov.
- 15—Pronotum distinctly impressed at base, the impression abruptly limited to about median half of the width, the surface before the impression never tumid at the middle.....16
- Pronotum distinctly impressed but more broadly and indefinitely, the impression extending from side to side.....17
- Pronotum not impressed at base, other than the fine line rendered apparent by the fine basal bead.....24
- 16—Body very elongate-oval, narrow, rather convex, polished, pale flavo-testaceous throughout, the pubescence very short, sparse and inconspicuous; antennæ rather short and thick, the club broader than usual, short, with its first two joints strongly transverse; prothorax not quite one half wider than long, the sides prominent near basal third, strongly convergent thence to the base, and, feebly, nearly to the apex, where they are rounded; punctures fine, but strong and rather sparse; elytra parallel, elongate, moderately obtuse at apex, slightly wider than the prothorax, very finely and quite sparsely punctate, the punctures strongly tending to serial arrangement. Length 1.75 mm.; width 0.7 mm. California (Sonoma Co.).....**ochronitens**, sp. nov.
- Body much smaller, elongate-oval and narrow, less shining and rather less convex, dark rufo-testaceous throughout; antennæ moderately developed, more slender, the club narrow, with its two basal joints but feebly transverse; pubescence very short, moderately sparse; prothorax moderately transverse, the sides distinctly sinuate just behind the middle, but not very prominent behind the sinus, thence converging strongly to the base, converging and rounded at apex, the latter but little narrower than the base; disk rather depressed, quite strongly and closely punctate, the basal impression strong; elytra rather less elongate, about two-thirds longer than wide, slightly wider than the prothorax, gradually rather obtusely rounded behind, the punctures strong and moderately close-set, not tending to linear arrangement. Length 1.5 mm.; width 0.65 mm. California (Siskiyou Co.).....**undulata**, sp. nov.

- 17—Pronotum evenly convex, not at all tumid at the middle before the basal impression, the surface sloping steeply to the impression, which is very fine; body narrowly oblong-oval, rather strongly convex, shining, black, the elytra feebly piceescent, the legs and antennæ dark rufo-testaceous; pubescence short but coarse and rather abundant; antennæ slender and rather more than half as long as the body, the basal joint well developed and nearly as long as the next three combined, the club rather small and narrow, with its two basal joints but slightly transverse; prothorax slightly transverse, evenly and strongly convex, fully as wide as the elytra, the sides subparallel, broadly, feebly arcuate, more convergent at base and apex, the latter but little the narrower; punctures only moderately coarse but strong and somewhat close-set; elytra barely three-fifths longer than wide, obtusely rounded behind, parallel, convex, the punctures strong, close-set and distinctly sublinear in arrangement. Length 1.4 mm.; width 0.6 mm. California (Lake Co.). **melas**, sp. nov.
- Pronotum more or less feebly, though perceptibly, tumid at the middle before the basal impression; body never entirely black. 18
- 18—Elytral punctures conspicuously coarse and well separated. 19
- Elytral punctures not very coarse, though always strong, and very distinct, generally less sparse. 21
- 19—Sides of the prothorax with a broadly rounded feeble sinus just behind the middle, a little more rounded but scarcely prominent near basal fourth, becoming apparently even and broadly arcuate throughout in *puella*. 20
- Sides of the prothorax strongly converging and broadly arcuate from basal fourth to apex with a very short feeble rounded sinus just before the slight prominence at basal fourth, from which point to the base they are strongly convergent; body oblong-oval, moderately stout and convex, shining, black, the elytra, legs and antennæ piceo-rufous; pubescence very short and moderately abundant; antennæ well developed, the club rather stout, with its two basal joints strongly transverse, prothorax fully one-half wider than long, the apex very much narrower than the base, the punctures not very coarse but deep and only moderately close; elytra scarcely more than one-half longer than wide, fully a fourth wider than the prothorax, parallel, obtusely rounded in apical two-fifths, the punctures quite coarse and moderately close-set. Length 1.3 mm.; width 0.55 mm. California (Siskiyou Co.). **soror**, sp. nov.
- 20—Body moderately stout, elongate-oval and convex, shining, blackish, the elytra, legs and antennæ testaceous; pubescence short and sparse; antennæ rather long and slender, nearly half as long as the body, the club moderately wide, rather long and loose, its two basal joints transversely obtrapezoidal, the eighth joint subquadrate and but slightly narrower than the seventh; prothorax well developed and transverse, fully two-fifths wider than long, narrowed only slightly in basal fourth, the apex but little narrower than the base; surface almost evenly convex, finely but strongly, somewhat closely punctate; elytra parallel and broadly arcuate at the sides, obtusely rounded at apex, three-fifths longer than wide and but little wider than the prothorax, the punctures coarse and moderately sparse. Length 1.65 mm.; width 0.7 mm. California (Humboldt Co.).
- cribripennis**, sp. nov.

Body smaller and narrower, the elytra parallel and only very slightly arcuate at the sides, similar in coloration and vestiture to *cribrifennis*, the antennae shorter, distinctly less than half as long as the body, the club shorter, more compact and unusually broad, its two basal joints strongly transverse, the eighth joint very small and much narrower than the seventh; prothorax narrower and less transverse, a third wider than long, otherwise similar, except that the sides are perceptibly convergent and the apex distinctly, although not greatly, narrower than the base; elytra two-thirds longer than wide, obtusely rounded behind, distinctly wider than the prothorax, the punctures coarse and sparse, becoming gradually fine and rather close posteriorly. Length 1.28-1.55 mm.; width 0.45-0.6 mm. California (Monterey).....**dispersa**, sp. nov.

Body still smaller and narrower, piceous, the elytra pale testaceous, with a large piceous cloud on the suture behind the middle; antennae slender, fully half as long as the body, the club rather small and narrow, its two basal joints moderately transverse, the eighth joint but little narrower than the seventh; prothorax moderately transverse, nearly as in *cribrifennis* but more arcuate at the sides and with the punctures very sparse; elytra three-fifths longer than wide, parallel and broadly, distinctly arcuate at the sides, obtuse at apex, only very slight wider than the prothorax, the punctures coarse and quite sparse, notably less close-set than in either of the preceding. Length 1.1 mm.; width 0.48 mm. California.

puella, sp. nov.

21—Antennae moderately developed, rather stout, dark testaceous, the club rather broad and shorter, its two basal joints moderately, though very distinctly, transverse; body narrowly oblong-oval, rather strongly convex, polished, blackish-castaneous, the elytra slightly paler and more rufescent toward base; pubescence short, sparse and inconspicuous; prothorax moderately developed, a little less than one-half wider than long, the sides feebly convergent and broadly, almost evenly, arcuate from base to apex, with a short and scarcely visible sinus just behind the middle; surface strongly, almost evenly, convex, rather strongly, conspicuously and somewhat closely punctate, the basal impression quite finely and feebly impressed; elytra nearly three-fourths longer than wide, parallel and very feebly arcuate at the sides, broadly and obtusely rounded at apex, distinctly wider than the prothorax and about three times as long, the punctures rather fine but very deep, perforate and distinct, not very close-set and clearly inclined to serial arrangement. Length 1.45 mm.; width 0.58 mm. California (Sonoma Co.).....**castanea**, sp. nov.

Antennae rather slender, the club longer and narrow, with its first two joints not, or but very slightly, transverse.....22

22—Antennae only moderate in length, distinctly less than half as long as the body, the latter rather stout, oblong-oval, moderately convex, the pronotum rather less shining than the elytra, black, the legs piceous, the elytra and antennae paler and piceo-testaceous; pubescence very short and sparse; prothorax one-half wider than long, almost fully as wide as the elytra, very slightly narrowed at apex and abruptly and distinctly so near the base, the median tumidity before the basal impression very obvious; punctures not coarse but deep, perforate and close-set; elytra three-fifths longer than wide, parallel and nearly straight at the sides, parabolically obtuse in apical two-fifths, the punctures rather fine but deep, im-

- pressed, moderately close and not very distinctly inclined to serial arrangement.
Length 1.7 mm. ; width 0.7 mm. Alaska (Kenai).....**vespertina** Mikk.
Antennæ more slender and almost half as long as the body ; pubescence short and inconspicuous though rather abundant.....23
- 23—Body piceous, the elytra paler and piceo-testaceous, the antennæ testaceous, with the club slightly dusky ; prothorax small, but little more than a third wider than long, the sides distinctly, but obtusely, prominent at basal third, thence strongly arcuate and convergent to the base, very feebly and indefinitely sinuate before the prominence, and thence feebly convergent and broadly arcuate to the apex, which is subequal in width to the base ; surface broadly convex, finely but strongly, densely punctate ; elytra rather short and broad, parallel, somewhat narrowly parabolic behind from slightly behind the middle, three-fifths longer than wide and nearly a third wider than the prothorax, the punctures rather fine but strong, subimpressed, only moderately close and arranged wholly without trace of order. Length 1.5 mm. ; width 0.63 mm. California (Siskiyou Co.).
parvicollis, sp. nov.
- Body similar in coloration to the preceding but somewhat more narrowly oblong-oval ; prothorax more transverse, two-fifths wider than long, the sides nearly similar but scarcely at all prominent at basal third, the punctures less distinct and much less close-set, the basal impression finer and feebler ; elytra rather shorter, but little more than one-half longer than wide, very obtusely rounded behind, parallel at the sides and less arcuate and only about a fourth wider than the prothorax, the punctures similar but very close-set and arranged in conspicuously even, very close-set rows almost throughout. Length 1.4 mm. ; width 0.6 mm. California (Siskiyou Co.)**parvicollis**(♂)?
- 24—Antennæ rather short, scarcely two-fifths as long as the body, the club somewhat robust, with its two basal joints distinctly, though not strongly, transverse ; body oblong-elongate and parallel, piceous, the elytra and antennæ slightly paler and testaceous ; pubescence very short and rather abundant ; prothorax two-fifths wider than long, parallel, feebly sinuate at the middle point of the sides, obtusely prominent behind the sinus and thence narrowed to the base, the punctures strong and close-set ; elytra oblong, obtusely parabolic behind, three-fourths longer than wide, distinctly, though not greatly, wider than the prothorax, the punctures rather fine but strong and close-set, irregular in arrangement. Length 1.8 mm. ; width 0.75 mm. California (Siskiyou Co.).....**subrecta**, sp. nov.
- Antennæ slender, the club narrow, with the two basal joints not notably transverse.....25
- 25—Elytra much more than one-half longer than wide and but very slightly wider than the prothorax, the body narrow and elongate-oval.....26
- Elytra short and broad, about one-half longer than wide and fully two-fifths wider than the prothorax, the latter relatively very small.....27
- 26—Body black, the elytra and antennæ pale rufo-testaceous, the pubescence short and sparse ; prothorax shorter, two-fifths wider than long, distinctly and rather acutely prominent at the sides near basal third, narrowed gradually thence to the apex, which is slightly narrower than the base, with a small and almost imperceptible sinus just before the prominence, the punctures fine but strong and only moderately close-set ; elytra two-thirds longer than wide, evenly rounded in apical two-fifths, parallel toward base, the punctures moderately fine, strongly

impressed and somewhat close-set. Length 1.3-1.65 mm.; width 0.55-0.6 mm.

California (Siskiyou Co.).....**nigricollis**, sp. nov.

Body piceous, the elytra and antennæ slightly paler and rufous, the pubescence short but rather abundant; prothorax well developed, scarcely more than a third wider than long, parallel and broadly, feebly sinuate at the middle of the sides, arcuately and equally narrowed at apex and base, the surface rather strongly convex, only moderately finely, deeply and very closely perforato-punctate; elytra well developed, fully three-fourths longer than wide, parabolically rounding in apical two-fifths, parallel and almost straight thence to the base, the punctures rather fine but deep, close-set and arranged without order. Length 1.6-1.9 mm.; width 0.6-0.72 mm. California.....**longipennis**, sp. nov.

27.—Body evenly dark rufo-testaceous throughout, moderately convex and shining, the pubescence very short but somewhat abundant; antennæ moderate; prothorax nearly one-half wider than long, the sides conspicuously and rather narrowly prominent at basal third, thence strongly converging to the base and more gradually so and nearly straight to the apex, which is not distinctly narrower than the base; disk more convexo-declivous near the basal margin than in the three preceding species but not properly impressed, the punctures fine and rather evenly close-set, becoming very minute and sparse broadly along the middle; elytra short and broad, the punctures very fine but distinct and moderately close-set, altogether irregular in arrangement. Length 1.4 mm.; width 0.68 mm. California.....**subdentata**, sp. nov.

Ochronitens quite strongly resembles *stricticollis*, but differs in the more slender form of the body and in the very much more minute and sparse punctuation. The species described under the name *parvicollis* is represented by a unique, as is also the form with seriately punctured elytra which I have surmised to be its male: more material is necessary to decide this rather puzzling point, as the difference in elytral sculpture is certainly very marked. I have, however, noticed at times a slight sexual difference in density and arrangement of punctures elsewhere in the family. *Fuscicollis* of Mannerheim, and *planulata* of Mäklin, I have not seen, the latter is described as oblong, depressed, fusco-testaceous, finely and densely punctate with the legs and elytra rufo-testaceous.

Atomaria Steph.

The species of this genus are less numerous in America than *Agathengis*, and for the most part present a rather monotonous appearance. The body is generally oblong-oval and convex, shining and sparsely clothed with short subdecumbent hairs. The antennæ are usually slender, moderate in length, with the basal joint short and oblong or more developed internally toward base than externally: the joints

of the funicle are alternately shorter and longer as usual in the tribe, but they are somewhat more widely separated at base than in *Agathengis*; the first two joints of the club are generally about as long as wide or longer, and seldom at all transverse. The eyes are larger and more coarsely faceted as a rule than in *Agathengis*. The prothorax is narrowed anteriorly and generally more or less distinctly angulate at the middle—not nearer the base as in *Agathengis*—and the marginal fovea at the point of angulation is not so marked a character as it is in that genus; the edge is finely beaded and frequently feebly crenulate from the angulation to the base; the disk is evenly convex, becoming broadly concave along the very finely margined or simple transverse base. The prosternal process is narrow, but in certain species, such as the European *turgida* and *cephennioides*, becomes wider, more prominent and more strongly margined along the sides—a divergence in the direction of the remarkable genus *Sternodea*. There seem to be, in fact, several quite well defined subgenera among the species of the European fauna having for types such forms as *turgida*, with medially lobed thoracic base, stout antennæ and broader and more prominent prosternal process, *cephennioides*, with large and broadly truncate prothorax, broad prosternal process, stout antennæ and very small eyes, and *unifasciata*, which is perfectly congeneric with our species and might be regarded as *Atomaria* proper.

The elytra are finely, irregularly punctured, frequently subinflated before the middle, truncate at base and slightly impressed within the humeral callus. The abdominal sutures are straight, the first segment as long as the next two combined and the fourth shorter than the second or third. The legs and tarsi are slender.

The species before me may be identified as follows:—

- | | |
|--|---|
| Elytra conspicuously ornamented or bicolored, the lines of demarcation more or less well defined..... | 2 |
| Elytra unicolorous or nubilously darker toward base..... | 7 |
| 2—Elytra pale, a dark fascia just before the middle extending from side to side..... | 3 |
| Elytra black or blackish, the apical third or fourth abruptly, and the basal regions nubilously pale..... | 4 |
| Elytra black, abruptly pale in apical two-fifths to half, the base not paler, excepting, rarely, the humeral callus..... | 5 |
| 3—Suboval, strongly convex, picceous, the antennæ, legs and elytra pale luteo-flavate, the latter each with a large, broadly oval oblique blackish spot from basal third at the sides, the two mutually tangent on the suture at the middle; antennæ slender, half as long as the body; prothorax strongly, longitudinally convex in profile, moderately transverse, strongly rounded at the sides and narrowed per- | |

ceptibly more at apex than at base, the basal impression deep and rather narrow, the punctures minute and sparse; elytra widest before the middle, narrowly rounded at apex, distinctly wider than the prothorax and but two and one-half times as long, the punctures very fine but subperforate and sparse. Length 1.4-1.5 mm.; width 0.65-0.7 mm. Vermont and Rhode Island to Iowa and Colorado.....**ephippiata** Zimm.

Var. A.—Similar to *ephippiata* in form and size but more narrowly elongate-oval and with the antennæ shorter, the elytral spots broadly uniting on the suture, and with the elytral punctures quite coarse, deeply impressed and apparently denser. Washington State (Spokane Falls)....**hesperica**, v. nov.

Suboblong oval, convex, much smaller in size, pale and rufo-testaceous throughout, the head blackish, each elytron with a narrower oblique black band from basal third externally to the suture at the middle, and spreading longitudinally on the flanks; antennæ moderate, less than half as long as the body, the prothorax moderately transverse, but little narrower at apex than at base, broadly rounded at the sides and more closely punctulate than in *ephippiata*, the basal impression confined to median two thirds of the width; elytra nearly similar to the preceding in form but only very slightly wider than the prothorax and much more closely, though equally finely, punctate. Length 1.1-1.22 mm.; width 0.52-0.58 mm. California to Washington State (Spokane Falls).....**lætula** Lec.

4—Elongate-oval, convex, shining, rufo testaceous throughout, the under surface generally piceous, the elytra shaded with blackish from near the base to apical third or fourth; antennæ slender, half as long as the body, a little shorter in the female; prothorax moderately transverse, rather strongly narrowed from base to apex, the sides broadly and feebly subangulate at the middle, the base broadly, feebly arcuate; basal impressions strong, extending almost to the sides, gradually evanescent laterally; disk only moderately convex longitudinally, the punctures strong, moderately coarse and well separated; elytra at least three times as long as the prothorax and distinctly wider, very much so in the female, more declivous toward apex in profile, the sides parallel and almost evenly arcuate; apex rather obtusely rounded; punctures fine but distinct, moderately sparse. Length 1.4-1.6 mm.; width 0.65-0.72 mm. California (Los Angeles to Monterey)

nubipennis, sp. nov.

5—Species of the Pacific coast regions. Body somewhat broadly oval, strongly convex, polished, black throughout, the antennæ and legs testaceous; elytra pale in apical two-fifths to half, the margin of the pale area broadly and posteriorly angulate; pubescence ashy and distinct; antennæ slender, nearly half as long as the body, shorter in the female; prothorax moderately transverse, both this and the elytra strongly arcuate in profile as in *ephippiata*, the apex distinctly narrower than the base, the sides broadly subangulate at the middle, the basal impression strong, not extending beyond lateral fourth or fifth, the punctures fine but deep and quite close-set; elytra much wider than the prothorax and not quite three times as long, the sides almost evenly arcuate from the humeri to the sutural angles, but little wider before the middle than at base, the apex ogival; punctures very fine but strong and perforate, quite close-set. Length 1.3-1.4 mm.; width 0.68-0.72 mm. California (Monterey to Humboldt Bay) and Nevada (Reno).....**postpallens**, sp. nov.

- Species of the Atlantic slope.....6
- 6—Rather narrowly oval, strongly convex, polished, dark rufo-testaceous throughout, the sterna of the hind body and basal half of the elytra black, the pale apex more advanced on the suture; pubescence very sparse; antennæ slender, not quite half as long as the body; prothorax not more than three-fifths wider than long, subangularly inflated at the middle, the apex but little narrower than the base, the basal impression rather feeble and medial; disk strongly, longitudinally convex in profile, the punctures small and very sparse; elytra two and one-half times as long as the prothorax and distinctly wider, the sides evenly, strongly arcuate, the apex rather acute, punctures fine and very sparse. Length 1.35 mm.; width 0.63 mm. District of Columbia.....**distincta**, sp. nov.
- More broadly oval, strongly convex, nearly similar in coloration to the preceding but paler testaceous, the elytra black in basal half, less on the suture; antennæ slender and half as long as the body; prothorax shorter and more transverse, three-fourths wider than long, the sides strongly arcuate, the apex but little narrower than the base, similarly feebly impressed at base, the punctures fine and distinctly less sparse; elytra distinctly wider than the prothorax and about three times as long, subangularly inflated and widest at basal two-fifths, the apex acutely rounded; punctures fine and rather sparse but much less so than in *distincta*, the pubescence similarly very short. Length 1.4 mm.; width 0.7 mm. Iowa (Independence).....**divisa**, sp. nov.
- 7—Second antennal joint subequal in length to the third, both elongate; base of the prothorax transverse and rectilinear or very feebly arcuate.....8
- Second antennal joint much longer and generally thicker than the third, frequently as long as the third and fourth combined; base of the prothorax variable, sometimes distinctly lobed in the middle10
- 8—Base of the prothorax, at the middle, finely beaded and frequently abruptly though feebly elevated.....9
- Base of the prothorax reflexed but not beaded at the middle of the base. Body piceous, the elytra paler, sometimes wholly pale, rather stout, oval, strongly convex, highly polished and very sparsely clothed with short recurved pubescence; head subimpunctate, the eyes rather small; antennæ slender, a little less than half as long as the body; prothorax scarcely two-thirds wider than long, widest and broadly angulate at the sides just before the middle, the apex very much narrower than the base; surface strongly convex, minutely and very sparsely punctate, the basal impression broadly concave and gradually evanescent laterally; elytra at base slightly wider than the base of the prothorax, widest, but not inflated, before the middle, where they are a third wider than the prothorax, not quite three times as long as the latter, oval, rather pointed behind, strongly but very sparsely impresso-punctate. Length 1.6–1.75 mm.; width 0.72–0.88 mm. New Jersey.....**gilvipennis**, sp. nov.
- 9—Body oval in form and strongly convex.....10
- Body oblong or oblong-oval in form and subparallel at the sides.....15
- 10—Juxtahumeral impressions at the base of the elytra very large and conspicuous, though shallow. Body short and very stout, dark rufo-piceous in color throughout; legs and antennæ pale, the latter moderately slender and nearly half as long as the body; prothorax well developed, strongly convex, fully three-fourths

wider than long, widest and broadly angulate at the sides at the middle, the apex much narrower than the base; punctures fine but deep and perforate, separated by two or three times their diameters, with a narrow impunctate median line not attaining the base, the basal impression well developed, the basal bead very feeble and flat; elytra subinflated and widest at two-fifths, where they are a fourth wider than the prothorax, about three times as long as the latter, the humeri narrowly exposed at base, the apex narrowly rounded; punctures very small but perforate and moderately close-set. Length 1.45 mm.; width 0.75 mm. Canada (Ottawa).....**saginata**, sp. nov.

Juxtahumeral impressions very small and feeble.....11

11—Prothorax rather rounded than angulate at the sides at or before the middle.....12

Prothorax conspicuously, though broadly, angulate at the sides at or slightly before the middle, where it is much wider than at base, the sides rapidly convergent from the angle to the apex and straight or broadly sinuate; elytral humeri distinctly exposed at base.....13

12—Prothorax relatively long and narrow, scarcely three-fourths as wide as the elytra and but little wider at the submedian dilatation than at base, very strongly narrowed at apex, the latter much narrower than the base; body elongate-oval, shining, testaceous throughout, the antennae distinctly less than half as long as the body in the female; prothorax strongly convex, finely but deeply and closely perforato-punctate, the basal impression deep and narrowly impressed; elytra distinctly wider at two-fifths than at base, where they are scarcely wider than the base of the prothorax, two and two-thirds times as long as the latter, acutely rounded at tip, the punctures fine but distinct, rather impressed and moderately close-set, at least three times as sparse as those of the prothorax. Length 1.6 mm.; width 0.78 mm. District of Columbia.....**ochracea** Zimm.

Var. A—Similar in color but with the head and prothorax slightly piceous, the latter equally distinctly and very closely punctate, the punctures separated by only their own diameters, and, as usual, coarser toward the sides and basal angles; basal impression much feebler and less acutely impressed; elytra strongly and rather sparsely impresso-punctate; body more narrowly oval. Length 1.65 mm.; width 0.75 mm. Lake Superior.....**lacustris**, v. nov.

Var. B—Body nearly similar in form but slightly smaller and more rapidly attenuate at the extremities, blackish-piceous to dark testaceous in color, polished, the pronotum finely and rather sparsely punctate, the basal impression much feebler and more broadly impressed than in *ochracea*; elytra minutely and rather feebly, moderately sparsely punctate, the punctures but little more widely separated than those of the pronotum. Length 1.2–1.5 mm.; width 0.58–0.75 mm. Mountains of Pennsylvania (Westmoreland Co.).

pennsylvanica, v. nov.

Prothorax shorter and decidedly more transverse, two-thirds to three-fourths wider than long, much narrower at base than at the median inflation, at least four-fifths as wide as the elytra, distinctly, though less markedly, narrower at apex than at base, strongly convex, finely and rather sparsely punctate, the basal impression rather deep and acutely impressed; elytra shorter and less obviously narrower at base than at the feeble inflation two-fifths from the base, the humeri more widely exposed at base, less than three times as long as the prothorax and narrowly

rounded at tip, the punctures fine but rather strongly impressed, moderately sparse and slightly more widely separated than those of the pronotum; antennæ slender, half as long as the body in the male, a little shorter in the female; body piceotestaceous in color, shining. Length 1.25-1.45 mm.; width 0.63-0.75 mm. Canada (Ottawa) ... **curtula**, sp. nov.

Var. A.—Similar but less stout and much smaller, piceous in color, the legs and antennæ pale luteo-flavate, the latter slender, fully half as long as the body; eyes slightly larger, convex and well developed; pubescence finer and a little closer; prothorax similar in form, deeply and rather acutely impressed at base, very finely and moderately closely punctate; elytra very finely, feebly, rather inconspicuously and moderately closely punctate, otherwise nearly similar. Length 1.2 mm.; width 0.6 mm. Iowa..... **pumilio**, v. nov.

13—Prothorax small, at its widest part not quite as wide as the base of the elytra, the latter less than three times as long as the prothorax. Body rather broadly oval, moderately convex, polished, pale ferruginous in color throughout, the antennæ slender, not quite half as long as the body in the male, shorter and a little stouter in the female; prothorax nearly two-thirds wider than long, angulate at the middle, the sides thence to the base distinctly convergent, feebly arcuate and minutely serrulate, more strongly convergent and feebly sinuate to the apical angles, which are somewhat prominent, the apex distinctly narrower than the base; disk finely but deeply, moderately closely punctate, the impression along the base rather deep; elytra about one-half longer than wide, subinflated at two-fifths and nearly a third wider than the prothorax, acute at tip, finely but strongly and somewhat sparsely impresso-punctate, the punctures at least twice as sparse as those of the pronotum. Length 1.4-1.6 mm.; width 0.7-0.75 mm. New York—Mr. H. H. Smith..... **gonodera**, sp. nov.

Prothorax small, nearly as in the preceding but with the converging sides anteriorly not sinuate and the apical angles not so acute. Body similar but shorter and more convex, black or blackish in color, the legs and antennæ dark testaceous; surface polished; antennæ slender, moderate in length; pronotum similarly punctured and impressed; elytra a little shorter and relatively broader, strongly rounded at the sides, acute at apex, more finely and sparsely punctate. Length 1.5 mm.; width 0.73 mm. Delaware to Florida..... **riparia**, sp. nov.

Prothorax more developed, at its widest part fully as wide as the base of the elytra, the latter fully three times as long as the prothorax..... 14

14—Oval, moderately convex, subalutaceous in lustre, piceous, the elytra slightly paler; legs and antennæ pale; eyes rather well developed, convex; antennæ moderately slender, with the club rather stout, distinctly less than half as long as the body in the female; prothorax nearly four-fifths wider than long, the sides prominently inflated before the middle, thence converging and arcuate to the base and strongly convergent and feebly sinuate to the apex, the latter not more than three-fourths as wide as the base; punctures small but deep and distinct, notably dense, the basal impression strong; elytra fully three times as long as the prothorax, widest, inflated and a fourth wider than the prothorax at two-fifths, rapidly narrowed thence to the acutely rounded apex; punctures fine, moderately close-set, twice as sparse as those of the prothorax. Length 1.6 mm.; width 0.72 mm. (♀) Rhode Island (Boston Neck)..... **subalutacea**, sp. nov.

Oval, rather more convex, shining, black, the antennæ and legs dark testaceous; antennæ slender, less than half as long as the body in the female; prothorax more than three-fourths wider than long, somewhat obtusely angulate and inflated at the middle, the sides thence straight and moderately convergent to the base and strongly so and straight to the apex; punctures fine and somewhat sparse, the impression deep; elytra nearly as in the preceding but more than a fourth wider than the prothorax, the punctures very fine and quite sparse—though but slightly sparser than those of the pronotum. Length 1.5 mm.; width 0.7 mm. (♀). (Colorado).....**incerta**, sp. nov.

- 15—Body oblong, parallel, only moderately convex, polished, piceous, the entire elytra and legs pale flavo-testaceous, antennæ pale with the club infusate, somewhat slender and slightly less than half as long as the body; prothorax small, much narrower at any part than the base of the elytra, angularly inflated slightly before the middle, the sides nearly straight and converging to base and apex, the latter quite distinctly narrower than the base; disk convex, two-thirds wider than long, finely, rather sparsely punctate, the basal impression strong, extending evanescently to the very obtuse basal angles; elytra oblong, parallel and almost straight at the sides, broadly rounded at apex, more than three times as long as the prothorax and about a third wider, the humeri widely exposed at base, rather coarsely but not densely impresso-punctate and somewhat rugose by oblique illumination. Length 1.55 mm.; width 0.72 mm. Colorado.

brevicollis, sp. nov.

Body oblong, the elytra feebly inflated, polished, black or blackish, the elytra very dark piceo-testaceous throughout; antennæ and legs dark testaceous, the former slender and nearly half as long as the body; prothorax large, three-fifths wider than long, fully as wide at base as the closely fitting base of the elytra and nearly as wide as at the very feeble subangular dilatation slightly behind apical third, the apex slightly narrower than the base; disk convex, finely and quite sparsely punctate, the basal impression moderate; elytra parallel and broadly arcuate at the sides, widest and distinctly wider than the prothorax at the middle, not more than two and one-half times as long as the latter, rapidly narrowed behind the middle and acutely rounded at tip, the punctures rather coarsely impressed, moderately close-set, not materially sparser than those of the pronotum. Length 1.4 mm.; width 0.65 mm. Alaska.....**aleutica**, sp. nov.

- 16—Prothorax subangularly dilated at, or a little before, the middle, narrowed toward base and still more strongly toward apex, the elytral humeri exposed at base.....17
- Prothorax, viewed vertically, rounded at the sides from the base, more strongly narrowed toward apex and widest perceptibly behind the middle.....18
- Prothorax, viewed vertically, parallel at the sides from the base to or beyond the middle, then strongly narrowed to the apex.....19
- 17—Body, legs and antennæ uniform pale ochreo-testaceous throughout, the latter rather short and stout, but little longer than the head and prothorax, the eyes moderate; surface shining, the pubescence short, fine, ashy and rather abundant; prothorax four-fifths wider than long, not quite as wide as the base of the elytra, the sides broadly angulate at apical two-fifths, the apex distinctly narrower than the base, the basal impression rather feeble; punctures very fine and

quite close-set; elytra oblong, feebly arcuate at the sides, obtusely rounded at apex, barely three times as long as the prothorax and about a fourth wider, the punctures very fine and moderately close-set. Length 1.5 mm.; width 0.75 mm.

Colorado.....**oblongula**, sp. nov.

Body deep black throughout, the legs and antennae piceo-testaceous; surface polished, the pubescence short and inconspicuous; antennae moderately slender, distinctly longer than the head and prothorax, the latter convex, two-thirds wider than long and fully as wide as the base of the elytra dilated and strongly rounded laterally just before the middle, the converging sides thence nearly straight to the base and apex, the latter but little narrower than the base, the basal impression moderate, extending throughout the width but feeble at the sides, the punctures fine but deep and strong and not very close-set; elytra short, oblong, two and one-half times as long as the prothorax and barely a fifth wider, parallel and broadly arcuate at the sides and obtusely rounded at apex, rather strongly and moderately closely impresso-punctate. Length 1.3 mm.; width 0.6 mm. Iowa.

crypta, sp. nov.

Body very small, parallel, pale testaceous, the elytra gradually shaded blackish toward base; integuments shining; antennae slender, nearly half as long as the body; prothorax short and strongly transverse, about as wide as the elytra, angulato-dilated at the middle, the apex distinctly narrower than the base; punctures minute and moderately dense, the basal impression rather acutely impressed; elytra parallel, feebly arcuate at the sides, obtusely rounded at tip, three times as long as the prothorax in the female but obviously shorter in the male, the punctures very fine and moderately close-set. Length 0.88-1.05 mm.; width 0.35-0.48 mm. Europe and Northeastern America.....**pusilla** Schönh.

18—Body oblong sub-oval, parallel, convex, polished, blackish in color, the elytra gradually pale posteriorly and the humeral callus also slightly paler; legs and antennae testaceous; the latter moderately slender, nearly half as long as the body, the club rather thick; prothorax moderately transverse, rounded on the sides, more strongly toward base, from above, but broadly subangulate at the middle when viewed sublaterally, the punctures fine and moderately close-set, the apex but little narrower than the base, the basal impression distinct; elytra parallel, broadly arcuate at the sides, but little wider at the middle than at base and only slightly wider than the prothorax, nearly three times as long as the latter, moderately obtuse at tip, the humeri evidently exposed at base; punctures fine but strong and distinct, scarcely sparser than those of the prothorax. Length 1.2 mm.; width 0.5 mm. California.....**fallax**, sp. nov.

19—Species of the Atlantic regions. Body oval, rapidly attenuate at the extremities and very convex, shining, black or piceous-black, the legs and antennae testaceous, the latter notably stout, nearly half as long as the body in the male; prothorax small, less transverse than usual, three-fifths wider than long, the sides strongly converging anteriorly, the apex only two-thirds as wide as the base, the latter with a feeble but distinct arcuate lobe in median third; punctures rather strong and close-set, the impression somewhat feeble; elytra oval, subinflated, and, at two-fifths, very much wider than at base and a third wider than the prothorax, the base of the latter scarcely at all narrower than the base of the elytra, the humeri not exposed at base; apex narrowly rounded, the punctures fine but

- distinct, rather sparse, two or three times sparser than those of the pronotum. Length 1.22-1.4 mm.; width 0.6-0.73 mm. Canada, New York, Pennsylvania, and Iowa.....**ovalis**, sp. nov.
- Species of the Pacific coast and Alaska20
- 20—Larger species, oblong oval in form, rather stout, convex, polished, black, the entire elytra bright testaceous; legs piceous; the antennæ pale, with the club rather stout; prothorax but little more than one-half wider than long, subangularly rounded at the sides slightly before the middle, then strongly narrowed to the apex, finely, rather sparsely punctate, as wide at base as the base of the elytra, the latter parallel and broadly arcuate at the sides, rather narrowly rounded at apex, finely but strongly, rather sparsely impresso-punctate. Length 1.6 mm.; width 0.78 mm. Alaska (Kodiak Island).....**fulvipennis** Mann.
- Small species, shining, rather narrow and elongate-oval in form.....21
- 21—Black, the elytra piceous, the legs paler; antennæ testaceous, moderately stout, two-fifths as long as the body; prothorax short, three-fourths wider than long, very slightly narrower than the base of the elytra, the sides parallel almost to apical third, then strongly convergent to the apex, the punctures strong, deep and close-set, dense toward the sides, the basal impression moderate, not attaining the sides; elytra parallel and broadly arcuate at the sides, rather obtuse at apex, fully three times as long as the prothorax, finely and rather sparsely punctate, the punctures much less close than those of the pronotum. Length 1.25 mm.; width 0.6 mm. California (Mendocino Co.).....**inepta**, sp. nov.
- Black, the elytra suffusedly paler toward tip, frequently pale ferruginous throughout, the antennæ pale, rather stout, two-fifths as long as the body; prothorax rather small, three-fifths wider than long, slightly narrower than the base of the elytra, the sides parallel for three-fifths the length, then moderately converging to the apex, the punctures very fine and rather close set, not materially denser laterally, the impression rather fine and moderately deep; elytra parallel, broadly arcuate at the sides, somewhat obtuse at apex, widest at the middle, not quite three times as long as the prothorax and fully a fourth wider, the punctures fine but strong and moderately close-set. Length 1.2 mm.; width 0.55 mm. California (Hoopa Valley, Humboldt Co.).....**nanula**, sp. nov.

The species in the neighborhood of *ochracea* form a very difficult study, and my treatment of them above must be regarded as provisional. *Fallax* bears some resemblance to *nanula*, but the antennæ are more approximate in insertion upon the front, being separated by a third of the total width in the latter. *Kamtschatica* Mots., is quoted by Mannerheim as occurring in Alaska, but I have not seen it: it is ovate, black, with the elytral humeri and apex testaceous and the prothorax arcuately dilated at the middle. The species *lepidula* of Mäklin, from Sitka, is also unknown to me: it is described as oval, slightly convex, shining, testaceous, with the prothorax slightly rounded at the sides and deeply, the elytra finely, punctate, and the antennæ not approximate at base: it must be an unusually large

species, as its length is given "1 line," and it is said to be extremely rare.

Tisactia, gen. nov.

Although bearing a certain general resemblance to *Atomaria*, this genus is really profoundly different in several structural characters, and it may be readily recognized by the marginal bead at the base of the elytra: it also differs in having the pronotum perfectly even and unimpressed at base, in its widely separated frontal antennae and in its broad prosternal process, margined at each side by an acute cariniform edge. The head is rather deeply inserted, the eyes well developed and rather coarsely faceted but not very convex, and the clypeus, which is slightly prolonged and expanded before the antennae, is separated from the front by an impressed straight suture extending between the antennal foveae. The antennae are nearly as in *Atomaria*, the first joint relatively still smaller but subsimilar in form, and the club parallel, loosely 3-jointed and well developed. The legs and tarsi are slender, the latter filiform, moderately short and pentamerous, the mesosternum moderately wide and unimpressed between the coxae, and the deep-set anterior coxae are oblique and much more transverse than in *Atomaria* approaching *Ephistemus* in this respect, the cavities sharply angulate externally. The scutellum is moderate in size and transversely oval. The single species is the following:—

Body oblong-oval, very convex, black or blackish, the legs and antennae paler, testaceous, the club of the latter blackish, apparently glabrous, each puncture, however, with an excessively minute hair; punctures throughout very fine and sparse, not denser on the prothorax, which is moderately transverse, very convex and deep on the flanks, the base distinctly wider than the apex, transverse, finely beaded and feebly lobed at the scutellum; sides broadly arcuate from above, the lateral edges finely but acutely reflexo-banded and nearly straight from a sublateral viewpoint; elytra slightly longer than wide, ogival at tip, widest and distinctly wider than the prothorax slightly before the middle, the base equal to the base of the latter, the humeri not at all exposed at base, the sides arcuate, the suture not margined, minutely dehiscent at apex as usual. Length 0.9 mm.; width 0.55 mm. Indiana**subglabra**, sp. nov.

Two specimens are before me, one much damaged.

EPHISTEMINI.

This is one of the more highly specialized tribes of the family, composed of very minute, broadly oval and convex glabrous species, feebly represented in the nearctic, but moderately abundant in the

palearctic provinces. It is distinguished from the other tribes of the Atomariinæ, excepting the Sternodeini, by the structure of the pro- and mesosterna, and in the close juncture of the prothorax with the hind body, and, in the extremely specialized *Ephistemus*, also by a form of anterior coxa, antennal club, antennal clefts of the prosternum and form of scutellum which are wholly foreign to the rest of the family. The post-coxal plates of the first ventral segment, though feebly developed, should also be alluded to as an important distinguishing character. In the general structure of the body, legs, palpi and tarsi it is however a perfectly normal member of the subfamily Atomariinæ. The elytra are never margined at base, the pronotum is always unimpressed, and the deeply seated anterior coxæ are transverse and subcylindrical and attached near the sides of the body, the cavities acutely angulate externally. The species before me may be assigned to the two following widely differentiated genera:—

Antennæ free, the club more slender and bilaterally symmetric, the grooves before the eyes and prosternal clefts wholly obsolete; scutellum transversely oval as in Atomariini; prothorax more transversely truncate at base, feebly arcuate at the middle **Curelius**

Antennæ partially received in repose within narrow deep grooves before the eyes and in a broad shallow cleft and excavation between the prosternum and hypomera, the club rather more developed, parallel, loose and asymmetric, the joints being more developed on the inner side; scutellum still more minute, cordate, pointed behind and as long as wide or longer; prothorax broadly angulate at base.

Ephistemus

These genera are related to the Atomariini through the singularly synthetic genus *Tisactia* described above, which has the unimpressed pronotum, broad, flat and laterally margined prosternal process, antennal insertion and sensible, though somewhat differently formed, post-coxal plates of the Ephistemiini, the loosely connected body and prothorax and free prosternal process of the Atomariini, and a strongly margined elytral base, which very exceptional character is foreign to both but existent to a well-developed degree in *Tomarus* of the Cryptophaginæ.

Curelius, gen. nov.

This genus is founded upon the *Ephistemus dilutus* of Reitter, and *exiguus* of Erichson, and, as far as known to me, is exclusively European. Although abundantly distinct from *Ephistemus*, it does not seem to have been recognized thus far by Reitter and other European authors.

Ephistemus Steph.

In this genus, as in the preceding, the body is evenly oval and rather pointed behind, the sides of the elytra and prothorax being perfectly continuous and without a reëntrant angle at the contiguous bases. The surface is virtually glabrous, having only a few extremely minute hairs visible under high amplification, and is feebly and sparsely sculptured. Our single representative is the following :—

Oval, convex, polished, black or piceous-black the elytra gradually rufo-testaceous posteriorly almost in apical half, the legs and antennæ paler ; surface impunctate ; prothorax moderately transverse, the sides convergent and rather strongly, almost evenly arcuate ; elytra rather less than three times as long as the prothorax and about a third to nearly half wider, widest at two-fifths, the sides strongly, almost evenly arcuate, converging behind, the tip narrowly rounded. Length 1.1 mm. ; width 0.72 mm. New York, New Jersey, Pennsylvania and Indiana.

apicalis Lec.

Almost perfectly resembles the European *dimidiatus*, but rather stouter and much larger ; the latter species seems to be distinct from *globulus*, with which it is united as a variety in the European catalogue of Heyden, Reitter and Weise.*

TRITOMIDÆ.

MYCETOPHAGIDÆ Auct.

It matters but little what name is used to designate a genus, and consequently perhaps, a family, provided it be the oldest properly published name, and that there be unanimity of opinion in regard to the points at issue. The Geoffroyian name *Tritoma* has been adopted in the most complete European catalogue, presumably after proper investigation, for the familiar *Mycetophagus*, and, as arbitrary dissent from this decision would only tend to perpetuate ambiguity in the fundaments of nomenclature, I am ready to take any course which

* The following is a new species from the European fauna, recently received from Mr. Reitter :

Narrowly oval, polished, blackish throughout, the elytra obscurely rufescent, blackish toward base, the legs and antennæ pale, extremely minutely, feebly and sparsely punctate; prothorax rather short and strongly transverse, the sides converging and arcuate as usual; elytra relatively long, rather more than three times as long as the prothorax but only about a fourth to a third wider, subinflated between a third and two-fifths from the base and narrowly rounded at tip. Length 0.95 mm. ; width 0.6 mm. Russia (Caucasus)..... *reitteri*, sp. nov.

Distinguishable at once from *globulus* or *dimidiatus* by its narrower and less ovate form, the elytra in the species referred to being from two-fifths to a half wider than the prothorax.

may tend to bring about permanent agreement, assuming that it is never too late to correct a mistake, however repugnant it may be to our spirit of conservatism. The name *Triplax* is therefore to be re-established in the Erytylidæ.

The present family is taken up for investigation at this time, primarily to draw attention to the inharmonious and composite scope which has been given to it hitherto by our systematists. Of the genera which have been included within its limits by LeConte and Horn, *Diplocælus* and *Biphyllus* are assigned by Heyden, Reitter and Wise to the Cryptophagidæ, which disposition of them is eminently appropriate. *Hypocoprus* forms a subfamily of Cucujidæ near the Monotominæ, and is also to be removed.

Again, as an important fact because affecting both the European and American scope of the family, it should be stated that *Berginus* is in no wise allied to the Tritomidæ, but belongs near *Lyctus*, in fact only distinguishable from that genus by the obliquely truncate maxillary palpi.*

Finally, but by no means least, it is to be remarked that the European *Triphyllus* does not occur in America, the species assigned by LeConte and Horn to that genus forming in reality two purely heteromorous genera in the vicinity of the malandryid *Tetratoma*. The Tetratomini are distinguished from other Malandryidæ by the 3- or 4-jointed antennal club, and will be alluded to in more detail near the close of the present paper.

The present family is evidently closely related to the Trixagidæ

* The following is an interesting new species of *Berginus* :—

Very slender, convex, blackish, the under surface, legs and antennæ paler; head and pronotum coarsely and closely punctured, the elytra with approximate series of similar coarse and close-set but well-defined punctures, each puncture throughout bearing a very small recurved squamiform hair; prothorax as long as wide, slightly narrower than the elytra and a little wider than the head, the sides arcuate and parallel; eyes small and prominent; antennæ slender, the two basal joints larger and the club 2-jointed; under surface coarsely, sparsely punctured, except the last four segments of the abdomen which are finely and longitudinally strigato-punctate, the first segment as long as the next three combined; legs short, the femora stout, the tibiæ and tarsi slender. Length 0.9-1.2 mm.; width 0.32-0.42 mm. Bahama Island (Eleuthera)—Mr. Wickham.

bahamicus, sp. nov.

Differs from *pumilus* in its smaller size, more slender form, evenly seriato-punctate elytra, even pronotum and general habitus. I have taken *pumilus* in abundance at San Diego, California; it has an almost entire longitudinal impression at each side of the pronotum, which exists in the European *tamarisci* only as a minute basal impression, and in *bahamicus* is wholly wanting; it was described from Pennsylvania, but perhaps this may be an error.

(Byturidæ) and Dermestidæ, and is quite out of position in the catalogue of Heyden, Reitter and Weise. Its general characters have been sufficiently presented by LeConte and Horn and need not be repeated at the present time. The tarsi are filiform and 4-jointed and the anterior in at least the first subfamily, are 3-jointed, more or less dilated and pubescent beneath in the males;* the basal joint is generally elongated. The anterior coxæ are large, obliquely ovoidal and prominently convex in the first subfamily but smaller in the second, narrowly separated, with the cavities widely open or closed. The ornamentation of the elytra in many species is remindful of the Attagenini, but the eyes are coarsely faceted—in marked contrast to the Dermestidæ. The Trixagidæ are intermediate between the two families in this respect.

The Tritomidæ of America consist of two subfamilies which differ greatly from each other in general habitus, and are sufficiently defined by the following characters:—

Anterior coxæ large and convexo-prominent, the cavities widely open behind; bases of the prothorax and elytra equal in width, the scutellum well developed; sides of the prothorax defined by a thin acute edge; hind coxæ narrowly separated.

TRITOMINÆ.

Anterior coxæ small and more deep-set, oblong-oval, the cavities broadly closed behind; base of the prothorax much narrower than that of the elytra, its lateral edges obtuse and not acutely defined; scutellum small; hind coxæ rather widely separated.....MYRMECHIXENINÆ.

The latter of these is represented by a single isolated genus common to Europe and America.

TRITOMINÆ.

The body is oblong-oval, convex or moderately depressed and always clothed with coarse and sparse pubescence. The four American genera before me may be separated by the following primary characters:—

Basal angles of the prothorax well defined.....	2
Basal angles broadly rounded; body very minute.....	5
2—Epipleure horizontal and flat.....	3
Epipleure concave and rapidly descending externally.....	4
3—Eyes transverse, sinuate anteriorly.....	Tritoma
Eyes more rounded, not sinuate.....	Typhæa

*The anterior tarsi are said to be 4-jointed in both sexes in the Myrmecchixeninae, but my four examples seem to be females and I cannot, therefore, confirm this.

- 4—Eyes nearly as in *Tritoma*; body much smaller and more oval.....**Litargus**
 5—Epipleura flat and horizontal, not extending much behind the middle.

Thrimolus

All of these genera are common to the Atlantic and Pacific districts, except the last, which has been taken thus far only in Texas.

Tritoma *Groff.**Mycetophagus* Hellw.

The species are oblong-oval in form, moderately convex and clothed rather sparsely with short stiff reclined pubescence, the elytra generally ornamented with a pale design upon a darker ground: they are moderately numerous and the American forms may be defined as follows:—

- Antennæ gradually incrassate toward tip, the outer joints sometimes feebly subsciriform, the prothorax widest at base, with the sides more or less strongly convergent and broadly arcuate thence to the apex, the two subbasal foveæ deep and distinct; body broadly oblong-oval. [*Tritoma*, in sp.].....2
 Antennæ with a very feebly differentiated subparallel 5-jointed club; prothorax but little wider at base than at apex, more or less serrulate at the sides, much wider near the middle, the sides strongly arcuate, the subbasal pits deep and distinct; body narrowly elongate-oval, the elytral intervals each with a series of semi-erect hairs. [*Ilendus*, sg. nov.].....8
 Antennæ with a feeble parallel 4-jointed club; body shorter and moderately broadly oblong-oval, the prothorax with the sides but feebly converging from the base and broadly arcuate, the subbasal pits distinct. [*Parilendus*, sg. nov.].....11
 Antennæ with a 3-jointed club; body rather broadly oblong-elongate, the prothorax widest before the base, with the subbasal pits feeble or obsolete. [*Gratusus* sg. nov.].....12
 2—Last joint of the antennæ elongate, distinctly longer than the two preceding combined; punctures rather coarse, not dense; elytra blackish, with a large reddish-yellow design involving the suture from fifth to three-fourths, extending obliquely to the humeri, and, transversely at its posterior limit, nearly to the side margin, the apices also yellow. Length 4.5–5.7 mm.; width 2.2–2.6 mm. New York, Indiana and North Carolina**punctata** Say
 Last joint of the antennæ shorter, never longer than the two preceding combined; body smaller in size.....3
 3—Elytral striae impressed, strongly punctured and distinct almost throughout. Atlantic regions.....4
 Elytral striae scarcely at all impressed, very finely punctured and almost completely obliterated behind the middle. Pacific coast.....7
 4—Pale design of the elytra somewhat as in *punctata*, involving the suture from basal fifth or sixth to slightly behind the middle, extending obliquely to the humeri, near which there is a projection from each side of the ramus, extending obliquely outward also at its posterior limit to the middle of the width and with

- a subdisconnecte 1 transverse lateral spot more posterior, the apex also maculate. Length 2.8-4.0 mm.; width 1.4-1.8 mm. New York, North Carolina, Indiana, Lake Superior and Montana; [*himaculata* Melsh.] **flexuosa** Say
- Pale design of the elytra never involving any part of the suture.....5
- 5—Side edges of the prothorax finely serrulate, the punctures not very dense, unequal as usual, moderately coarse toward the sides, which are narrowly explanate; elytra blackish-piceous, each with seven pale spots, one, quadrate, at the humeri, one smaller, rounded, at inner third and basal fifth, one small rounded, at inner fourth just behind the middle, one elongate, near the median line at four sevenths, one very small, subattached to the last at outer and basal third, one transverse, near the margin at three-fifths and one rather large, involving the apex. Length 3.6 mm.; width 1.7 mm. Virginia..... **serrulata**, sp. nov.
- Side edges of the prothorax even, not at all serrulate, the sides more or less narrowly explanate; abdomen finely and closely punctate.....6
- 6—Body more elongate-oval, larger and more convex; elytra each with a large subquadrate humeral pale spot not involving the callus, another, large and slightly elongate-oval, very near the suture at basal sixth and narrowly connected with the humeral, a narrow irregular spot near the center, extending along and scarcely broader than the sixth interval from three-sevenths to slightly behind the middle and then obliquely extending internally nearly to the suture at four-sevenths, two submarginal spots, the anterior minute at two-fifths, the posterior larger and transverse at three-fifths and a moderate subapical spot. Length 4.2-4.3 mm.; width 1.9 mm. New York..... **picta**, sp. nov.
- Body oblong-oval, rather depressed, black, the prothorax scarcely paler and more transverse than in *picta*; elytra of the male each with two large coalescent subbasal pale spots in oblique line and one, smaller, sublateral at one-fourth from the base and frequently obsolete, also an oblique irregular fascia at or near apical third, sometimes obsolete or existing as two minute pale spots, and, finally, a large subapical spot; in the female the inner of the two subbasal spots is wholly obsolete, only the humeral and subapical remaining, or, sometimes, with the two minute pale spots in oblique line near apical third in addition. Length 3.7-4.2 mm.; width 1.75-1.9 mm. Indiana and North Carolina.
- **subdepressa**, sp. nov.
- 7—Body oblong-elongate, rather depressed and shining, the punctures finer than usual; elytra blackish, each with a large oblique subbasal spot, from the humeri nearly to the suture at basal fourth, and a smaller transverse spot at apical fourth, not attaining the suture or margin; subapical pale spot wholly obsolete. Length 3.4-4.2 mm.; width 1.65-1.8 mm. Washington State to California.
- **californica** Horn
- 8—Elytra more than twice as long as wide; abdomen sparsely punctured; pronotum coarsely, sparsely and equally punctate.....9
- Elytra not more than twice as long as wide, the abdomen more closely punctured; pronotum less coarsely, more densely and somewhat unequally punctate.....10
- 9—Body black or piceous-black throughout above, the under surface, legs and antennae testaceous, the latter becoming blackish in outer half; elytra maculate with pale spots, of which two on each, elongate-oval, disposed in oblique line near the base and one transverse, discal and anteriorly angulate at apical third or fourth,

are most conspicuous, a small elongate spot, just before the middle and near the side margin, is also generally evident; striae strongly punctured, feebly impressed and distinct very nearly to the tip. Length 4.3 mm.; width 1.45 mm. Texas.

***melsheimeri* Lec.**

Body nearly similar in form and sculpture but rather less slender, the under surface and legs more dusky-testaceous, the antennae blackish throughout, except near the base, distinctly longer than in *melsheimeri* and almost two-fifths as long as the body in the male, the elytra black throughout, without trace of paler spots; intromittent organ of the male very slender and nearly straight. Length 4.6 mm.; width 1.6 mm. Indiana; [Georgia—LeConte].....***obscura* Lec.**

10—Body very narrow, piceous or blackish, the elytra with numerous small flavo-testaceous spots, the striae rather distinctly impressed but somewhat finely punctured and obliterated well before the tip; under surface, legs and antennae pale, the latter dusky distally as usual. Length 3.4 mm.; width 1.3 mm. Indiana.

***pluripunctata* Lec.**

Body distinctly broader but almost similarly sculptured, the prothorax less transverse, relatively narrower at apex and somewhat more coarsely punctured; elytra evenly piceous-black throughout, without trace of paler maculation; under surface, legs and antennae pale testaceous. Length 3.75 mm.; width 1.6 mm. North Carolina (Asheville).....***pini* Zieg.**

11—Body oblong-oval, rather strongly convex, the sides very feebly arcuate; antennae testaceous throughout, short and rather thick, not as long as the head and prothorax, the latter dark piceous-brown, three-fourths wider than long, the sides very feebly convergent from base to apex and very slightly arcuate; disk convex, coarsely, densely and unequally punctured throughout, the edges minutely serrulate; elytra dark, finely, densely punctulate, the striae feebly impressed, finely punctate and obliterated toward tip, each with a suffused humeral pale spot and another, transverse and discal, near three-fifths; each interval with a single series of suberect hairs; abdomen finely and densely punctate. Length 2.9–3.5 mm.; width 1.3–1.5 mm. Massachusetts, New York, Indiana, Iowa and Nebraska.

***bipustulata* Melsh.**

Body oval, piceous, sparsely pubescent; elytra densely punctulate, with a feebly striate arrangement at the middle near the base, maculate with large yellow spots somewhat as in *flexuosa*. Length [4.5 mm.]. Colorado***confusa* Horn**

12—Subbasal impressions of the pronotum distinct but in the form of short narrow canaliculations, the punctures moderately coarse, deep, not very dense, equal and evenly distributed throughout, the sides broadly, evenly arcuate, very feebly convergent, the apical angles broadly rounded; disk widest behind the middle; elytra piceous, with pale humeral, post-humeral and post-median maculation, the striae scarcely at all impressed, rather finely and not conspicuously punctured and obliterated toward tip, the pubescence short and even; abdomen finely, densely punctate. Length 4.3–4.8 mm.; width 1.7–1.9 mm. California (Truckee and Lake Tahoe).....***pluriguttata* Lec.**

Subbasal impressions small and feeble but rounded and foveiform.....13

Subbasal impressions wholly obsolete.....14

13—Elytra immaculate, except some very minute widely scattered pale spots which are clothed with paler pubescence, of which there is on each one at base at each

side of the scutellum, one at outer fourth and one-sixth from the base, two at inner fourth in line with the basal spot at two-sevenths and one-half from the base, and one, transverse, near the margin at three-fifths; body oblong-oval, piceous-black throughout, the prothorax a little less than twice as wide as long, with the sides feebly convergent and feebly arcuate, only slightly wider behind the middle than at base, the punctures rather fine, close-set and unequal, with coarse punctures intermingled toward the sides; elytral stria feebly impressed but strongly punctured, distinct nearly to the extreme apex; abdomen finely but not densely punctate; legs blackish, the tarsi paler. Length 5.0 mm.; width 2.1 mm. Florida, Columbia..... **notatula**, sp. nov.

Elytra with very narrow striae; bands of grayish pubescence at basal third and behind the middle, and also an apical spot, the posterior band bifurcating near the middle of each elytron, sending one branch forward the other backward to the side margin; body otherwise nearly similar to *notatula*. Length [5.0 mm.].

New Hampshire, White Mt..... **tenuifasciata** *Horn*

14—Body moderately stout, oval, strongly convex, piceous-black, the legs and antennæ paler; prothorax distinctly less than twice as wide as long, the sides strongly convergent throughout, but very feebly arcuate, absolutely serrulate, obliquely convergent near the base to the basal angles, which are very obtuse; disk convex, very coarsely, almost equally punctate, not densely toward the middle but closely laterally; elytra sparsely pubescent, with impressed entire striae of coarse deep punctures, each with an irregular pale oblique subbasal fascia from the humeri nearly to the suture, another, oblique in contrary sense, at three-fifths and not attaining the suture and an oval, margino-median and a subapical spot. Length 4.5 mm.; width 2.0 mm. Virginia..... **obsoleta** *Mel.*

Confuse and *tenuifasciata* I have not seen, and the characters are drawn from the descriptions. *Pariguttata* is a very aberrant species, with the 3-jointed club very much feebler than in the others of that section and with a very complex male intromittent organ, consisting of a gradually narrowed thin basal piece, arcuate in plane, with an apical appendage curved sharply in contrary sense, and having two posteriorly diverging, rapidly and finely acuminate basal alae and a terminal asymmetric button.

Typhæa *Curtis*.

Closely related to *Tritoma* and distinguished by the much smaller size of the body and the form of the eyes. The single species seems to be cosmopolitan:—

Narrowly oblong-oval, moderately convex, pale flavo-testaceous throughout, the elytra rarely piceous; antennæ with a 3-jointed club, distinctly shorter than the head and prothorax, the latter about twice as wide as long, with the apex but little narrower than the base and the sides arcuate, the punctures fine, subequal and rather close-set; elytra finely punctate, with unimpressed series of fine punctures

becoming obliterated toward tip, the pubescence short, moderately dense; each striaal interval with a single series of suberect hairs. Length 2.25-2.7 mm.; width 0.85-1.15 mm. Vermont to Washington State, Florida and Texas

fumata Linn.

The single specimen with dark elytra is from Palm Beach, Florida, and seems to have the prothorax slightly less transverse and the antennal club a little thicker; additional material may ultimately prove it to represent a variety or closely related species.

Litargus *Erichs.*

This genus differs profoundly from the two preceding in the form of the epipleuræ, but the eyes are nearly as in *Tritoma* and the antennæ have a loose 3-jointed club as in *Typhæa*. The ornamentation of the elytra is similar to that of *Tritoma*, and the body is very small in size. The species are rather less numerous than in *Tritoma* and may, as far as discovered, be separated by the following characters:—

Elytra with the pubescence short and sparse but stiff, pale in color and arranged throughout in even approximate series, piceous to blackish in color, each with a large transversely oval discal spot near basal and apical fourth, the posterior approaching more closely to the suture; punctures sparse throughout, the body rather broadly oval, convex and shining, the pronotum not impressed at base but with the basal sinuation at each side of the middle distinct; last antennal joint short, rounded, the labrum small; epistomal suture wholly obsolete. Length 1.7-2.0 mm.; width 0.85-1.2 mm. Rhode Island to Texas and Lake Superior.
[**Litargus**, *sg. nov.*].....**4-spilotus** Lec.

Elytra with the pubescence in general confusedly arranged.....2

2—Elytra with fine dark pubescence, closely punctulate and with widely separated single series of longer semi-erect and paler hairs, each with a small subbasal spot at three-fifths from the suture, a larger triangular subsutural spot at two-sevenths and an obliquely oval subsutural spot at five-sevenths, the pale spots clothed also with pale hairs; pronotum finely, not very densely punctate, the punctures simple and not asperate, feebly biimpressed at base; body elongate-oval and depressed; last antennal joint short, narrowly rounded at tip; labrum large and very transverse. [**Litargus** in *sp.*; type *convexus*]. Length 2.2 mm.; width 1.1 mm. Illinois and Kansas.....**6 punctatus** Say

Var A—Similar but with the rows of erect paler hairs only evident toward the sides of the elytra, the basal spot more oblique, the anterior subsutural smaller, rounded and more distant from the suture, the elytra relatively less elongate, the spots subobsolete occasionally. Length 1.8-2.2 mm.; width 0.9-1.2 mm. New Jersey and Indiana.....**obsolescens**, *v. nov.*

Elytra without widely separated series of pale hairs.....3

3—Epipleuræ strongly concave and deeply descending, the epistoma trapezoidal as usual.....4

- Epipleurae much narrower, almost flat and but slightly descending externally; epistoma rounded, the suture fine but rather more distinct; punctures granulato-asperate; last antennal joint short and transverse, somewhat obliquely but broadly rounded at tip; pronotum not at all impressed at base and with the sinuations very feeble. [*Paralitargus*, sg. nov.].....7
- 4—Last antennal joint elongate, the tip obliquely and rectilinearly truncate; pronotal punctures simple. [*Alitargus*, sg. nov.].....5
- Last antennal joint short and very broadly, subobliquely arcuato-truncate at apex; pronotal punctures minute, slightly elevated and subannulate. [*Litargellus*, sg. nov.].....6
- 5—Rather narrowly oval, moderately convex, shining, piceous or darker, finely, rather closely punctate, the pronotum with two feeble subbasal impressions, the basal sinuations small but evident; elytra with humeral, post-scutellar, subsutural and transverse post-median paler maculation and also with a very feeble paler spot at the side margin at two-sevenths, the paler spots clothed with paler pubescence. Length 1.75–1.9 mm.; width 0.9–1.0 mm. Texas to California (Los Angeles).
balteatus Lec.
- Var A—Similar but larger, more elongate-oval and more depressed, the body generally darker, the subbasal impressions of the pronotum feebler and less linear, the elytra similarly maculate. Length 2.2–2.4 mm., width 1.0–1.15 mm. California (San Francisco).....**transversus** Lec.
- 6—Body oval and strongly convex, shining, the punctures sparse, the pubescence fine and rather sparse, closely decumbent and even; prothorax about two and one-half times as wide as long, the sides strongly converging from base to apex and moderately arcuate, flavo-testaceous, sometimes transversely clouded with piceous in the central part; elytra flavo-testaceous, each with three incomplete narrow piceous fasciae, the two posterior anteriorly arcuate, the subbasal less obvious; Length 1.5–1.75 mm.; width 0.73–0.83 mm. New York and Pennsylvania to New Mexico (Las Cruces).....**nebulosus** Lec.
- 7—Elytra with the post-median pale fascia transverse, or, to a slight degree, posteriorly oblique toward the suture. Body narrowly oblong-oval, rather convex, not coarsely but strongly, somewhat closely and asperately punctate, blackish throughout above, the elytra each with an oblique pale spot from the humeri nearly to the suture at two-sevenths and a more or less narrow fascia at four-sevenths, which is virtually entire. Length 1.6–1.9 mm.; width 0.7–1.0 mm. Rhode Island and Illinois to Florida (Palm Beach).....**didesmus** Say
- Elytra with the posterior pale area median and anteriorly oblique toward the suture. Body narrowly oval and convex, not densely but strongly, evenly and asperately punctate, the pubescence shorter and sparser but coarse and rather pale in color; integuments piceous above, the elytra each with an oblique subbasal pale spot nearly as in *didesmus* and also having an equally broad and conspicuous pale spot extending from the sides, just behind the middle, almost to the suture well before the middle and near the apex of the subbasal spot. Length 1.6 mm.; width 0.78 mm. Dakota—Mr. Wickham.....**asperulus**, sp. nov.

In *6-punctatus* and its varieties the epistoma of the male is clothed densely with an extremely fine short pale pubescence, which is want-

ing in the female, and the labrum is larger than in any other species, extending to the extreme limits of the epistomal truncature. *Infulatus* of LeConte, I have not seen; it is said by Horn to be a synonym of *balticus*.

Thrimolus, gen. nov.

This genus is composed of a single exceedingly minute species, differing radically from those which precede in the broadly rounded basal angles of the prothorax. The body is oblong-oval, moderately convex, clothed rather sparsely with coarse and moderately long reclined hairs, with other longer erect setæ serially bristling from the elytral flanks. The head is large, transverse and well developed, the eyes moderately large, basal, not very prominent, somewhat transversely oval, entire and much less coarsely faceted than usual; the clypeus is rather short and broad, with the suture transversely rectilinear, not impressed and very feeble. Antennæ moderate in length, 11 jointed, with a compactly cylindric stout and 3-jointed club, the joints six to eight gradually increasing in width and decreasing in length, the latter as wide as the base of the club. Prothorax broadly arcuate and very finely beaded at base. Scutellum well developed, broadly subtriangular or parabolic. Anterior coxæ large, obliquely suboval, very convex and narrowly separated. Basal segment of the abdomen as long as the next two combined; two to four relatively shorter than usual and gradually diminishing somewhat in length, the hind coxæ very narrowly separated. Legs slender, coarsely, sparsely herissate with moderately long hairs, the tarsi extremely slender, filiform, much shorter than the tibiæ, with the basal joint but little longer than the second, normally 4-jointed throughout, the claws small and very slender; tibial spurs small and much less developed than usual.

The antennæ are bilaterally symmetric, shorter and more compact than in *Zyphra* and the elytral punctures are altogether irregular in distribution. The type may be briefly defined as follows:—

Body dark luteo-testaceous in color throughout, the legs and antennæ still paler, the club of the latter very feebly infusate, shining; head and pronotum subimpunctate, the latter short and strongly transverse, more than twice as wide as long, the sides converging, broadly arcuate and subcontinuous with those of the elytra, the disk wholly devoid of basal foveæ or impression; elytra oblong-oval, rather convex, slightly longer than wide, broadly and obtusely rounded conjointly at tip, much wider than the prothorax and more than three times as long, the sides broadly arcuate; punctures very fine, sparse and subasperate; under surface shining, sparsely clothed with coarse inclined hairs. Length 0.78 mm.; width 0.45 mm. Texas.....**minutus**, sp. nov.

The single example before me is so frail that I am unable to dismount it to better observe the structure of the mouth, the trophi however appear to be in perfect homology with the rest of the family.

MYRMECHIXENINÆ.

This subfamily is evidently assigned properly to the Tritomidæ by LeConte and Horn, although the facies departs conspicuously by reason of the small prothorax and wide elytra, the latter rather sparsely clothed with an even decumbent vestiture, finer and less conspicuous than in Tritominae. The single genus is as follows:—

Myrmecchixenus Chev.

Our single species occurs throughout the more southern parts of the United States, from the Atlantic to the Pacific, and may possibly be identical with some European form: it may be briefly defined as follows:—

Body narrowly oblong, convex, rather shining though finely, deeply and very closely punctured throughout, reddish-brown in color, the legs and antennæ paler; head subtriangular, the eyes well-developed, moderately convex, coarsely faceted as usual; antennæ moderate, the club loosely 5-jointed, joints six to eight increasing gradually in width; prothorax distinctly wider than the head, slightly transverse, widest near apical third, the sides parallel, rounded, the base and apex equal and feebly arcuate; elytra between two and three times as long as the prothorax and about two-fifths wider, the humeri exposed at base; sides parallel and broadly arcuate, the apex obtusely rounded; abdominal segments convex, gradually and but slightly decreasing in length, as usual in the Tritomidae, the last partly exposed dorsally. Length 1.7–1.8 mm.; width 0.75–0.78 mm. *latridioides* Crotch

This species does not appear to be very common; the specimens in my cabinet are from South Carolina, El Paso, Texas, and Riverside, California, the latter sent to me by Mr. H. C. Fall. The basal joint of the hind tarsi is much elongated, as in normal members of the family, which is an additional reason for believing that it is correctly placed in the Tritomidæ.

DERMESTIDÆ.

The Dermestidæ are a small family of clavicorn beetles, which, in their notably varied structural characters, seem to constitute one of the old synthetic types of Coleoptera, having some philogenetic relationship with both the Geodephaga and Serricornia. They have the anterior coxal cavities open behind, the tarsi simple and 5-jointed,

the claws unmodified, the sternal side pieces very wide and the hind coxæ lamellate and transversely excavated. The antennæ are extremely varied in structure and may or may not be received within protecting pits or excavations, and the legs may be free or strongly retractile. In considering the depression for the protection of the antennæ, a distinction should be drawn between a large and vaguely limited concavity of the hypomera—or inflexed side of the prothorax—as in *Dermestes*, and a closely circumscribed and sharply defined pit; the former characterizes most of the genera in some form, and becomes a true protective fossa in a few genera, but the latter only occurs in *Anthrenus*.

The genus *Trixagus* (*Byturus* Lat.), is evidently allied to the Dermestidæ, but differs in so many radical characters, such as the closed anterior acetabula, lobed tarsi, dentate claws, narrow sternal side pieces and structure of the mesosternum, that the position assigned it by Reitter as a distinct family is probably as satisfactory as any, and I have therefore not considered it in the following revision. As thus restricted, the American Dermestidæ may be assigned to five distinct tribes characterized as follows:—

- Head without ocellus; anterior coxæ large, contiguous, the prosternum not visible between them, the mesosternum between the coxæ moderately wide, ogival and not sulcate; antennæ 11-jointed, with a 3-jointed club, similar in the sexes and not received within sharply circumscribed pits; hypomera concave anteriorly; epipleuræ strongly defined, wide and inflexed toward base; body clothed with short hairsDERMESTINI
- Head with a single ocellus2
- 2—Prosternum visible between the coxæ; metacoxal lamina not extending to the sides of the body.3
- Prosternum not visible between the coxæ; metacoxal lamina extending to the sides of the body.5
- 3—Metacoxal plate extending laterally half way across the parapleuræ; prosternal process impinging upon the exposed surface of the mesosternum between the coxæ; epipleuræ well developed toward base; legs in great part free; body clothed with short hairs.ATTAGENINI
- Metacoxal plate only extending laterally to and abutting against—squarely in *Trinodini*, obliquely in *Anthrenini*—the inner boundary of the parapleuræ.4
- 4—Epipleuræ subobsolete; lateral margin of the prothorax entire as usual; antennal club received within deep fossæ at the apical thoracic angles; body compact, clothed with decumbent scales, the legs all very closely retractile; coxæ large; scutellum very minute.ANTHRENIINI
- Epipleuræ narrow but strongly delimited and inflexed toward base; lateral thoracic margins obliterated at apex; legs and antennæ perfectly free, excepting, as usual,

- the hind femora; coxæ small; body clothed with long sparse erect coarse and bristling hairs; scutellum largeTRINODINI
- 5—Anterior coxæ contiguous at apex over the prosternum, which has the form of a transverse pointed plate; antennæ 11 jointed, the club 3-jointed, not received within abruptly excavated pits, the hypomera biconcave; legs very closely retractile; body glabrous, the epipleuræ distinct toward base; scutellum well developed.

ORPILLINI

Except the small and isolated tribe Trinodini, which is confined to the Atlantic and Sonoran regions, all of these groups are very general in distribution.

DERMESTINI.

The genus *Dermestes* differs so greatly from the other types of the family in the absence of the very characteristic vertexal ocellus and contiguous anterior coxæ, that it is necessary to regard it as a distinct tribe. The metacoxal lamina is narrow, extending only to the parapleuræ, and is notably elongate internally, the tibiæ seriate with short stout spinules and the tarsi rather stout, with the basal joint shorter than the second, generally very markedly so, but sometimes only slightly as in *lardarius*.

Dermestes Linn.

The species of *Dermestes* are rather numerous and are the largest of the family. They can be readily classified by the form of the inner marginal suture of the abdomen toward base, and by the form and vestiture of the prothorax, as follows:—

- Inner lateral suture of the first abdominal segment inflexed at base to the outer limit of the hind coxæ, becoming deeply excavated at the basal margin2
- Inner lateral suture straight, not inflexed basally and distant at base from the outer limit of the coxæ; pronotum not deeply declivous laterally, the margin visible throughout from above10
- 2—Pronotum clothed densely throughout with variegated black and fulvous pubescence, except in *medialis*, the flanks deeply declivous; male with the third and fourth segments foveolate at the middle.....3
- Pronotum clothed with dense cinerous pubescence laterally, leaving a large triangular or parabolic discal area sparsely clothed with almost uniform pubescence, the flanks rather deeply declivous.....7
- Pronotum somewhat sparsely or inconspicuously and quite uniformly pubescent throughout, the flanks less declivous, the lateral margin visible from above throughout the length; third and fourth ventrals foveolate in the male.....9
- 3—Pronotum having, as a marked feature of the vestiture, three widely separated points of pale pubescence arranged transversely at about the middle of the length.....4
- Pronotum without the three points of paler pubescence.....6

- 4—Large species, 10 mm. or more in length; vestiture cinereous to ochreous, the pale points of the pronotum cinereous, sometimes ochreous and less distinct; elytra with a large oblong area of dense pubescence at each side, extending two-fifths, and elsewhere marmorate with black and cinereous or ochreous hairs; ventral segments each with the usual lateral dark spot, that of the basal segment very large; median fovee of the male very small. Length 10.0-12.5 mm.; width 3.9-5.3 mm. Texas to California. **marmoratus** Say
- Smaller species, always distinctly less than 10 mm. in length. 5
- 5—Pronotal punctures fine and more distinctly separated; body moderately large, the elytra marmorate with cinereous and black, usually subtransversely, and with certain parts of the surface uniformly clothed with the pale hairs, the abdomen densely clothed with whitish pubescence, with black lateral spots; ventral foveolae of the male much larger than in *marmoratus*. Area of uniform pale pubescence subquadrate, extending from near the base to basal third and from the side margin nearly to the middle. Length 7.5-8.4 mm.; width 3.5-3.75 mm. Atlantic Coast from Canada to Florida (Palm Beach); [*nubilus* Say, *dissector* Kby., and *murinus* Lec, nec Linn.]. **caninus** Germ.
- Var. A—Area of pale pubescence extending from near the base scarcely to basal third, but prolonged transversely to or near the suture. Length 7.0-8.3 mm.; width 3.0-3.75 mm. Pacific Coast. **mannerheimi** Lec.
- Var. B—Area of pale pubescence extending entirely across the elytra and prolonged to about apical third. Length 6.5-8.0 mm.; width 3.2-3.7 mm. Iowa (Keokuk) to Florida; [*nubilus* Lec, nec Say]. **nubipennis**, v. nov.
- Var. C—Area of pale pubescence extending at the lateral margin from the base for two-fifths and dilated internally subbasally nearly to the middle, the entire sutural region also clothed with a very large preponderance of pale hairs. Length 8.3 mm.; width 3.65 mm. Texas (Galveston). **compactus**, v. nov.
- Pronotal punctures quite coarse and more close-set; body very small in size, the elytra clothed to the tip with dense cinereous pubescence, with a few small black spots, especially at base; ventral pubescence much less dense, especially toward tip. Length 5.0 mm.; width 2.2 mm. Oregon. **rattus** Lec.
- Pronotal punctures coarse, deep and narrowly separated; body small in size, elongate oval and strongly convex, deep black throughout, the pronotum clothed rather sparsely and almost uniformly with dusky pubescence, with three small widely separated spots of pale pubescence arranged transversely; scutellum transverse, densely clothed with coarse pale yellowish hairs; elytra rather coarsely and quite closely punctured and clothed uniformly throughout with short blackish inconspicuous hairs; abdomen densely clothed with white pubescence only in the middle third of the two basal segments, elsewhere more sparsely clothed with a mixture of white and fuscous hairs; femora annulated. Length 5.6 mm.; width 2.4 mm. California. **medialis**, sp. nov.
- 6—Elytra transversely marmorate with black and cinereous pubescence, the pale hairs generally forming a condensed transverse fascia behind the base, the portion thence to the basal margin having some fulvous hairs intermingled; body larger and more broadly oval. Length 6.8-7.5 mm.; width 3.0-3.5 mm. Wyoming to New Mexico (Fort Wingate) **fasciatus** Lec.

- Elytra finely and more uniformly variegated with black, cinereous and fulvous hairs throughout; body narrowly and evenly ellipsoidal, rather small in size. Length 5.0-6.7 mm.; width 2.35-3.0 mm. Idaho (Cœur d'Alène), Nevada (Reno) and California (San Francisco and Monterey).....**talpinus Mann.**
- 7—Elytra black, rufo-piceous toward the humeri, where there is a small post-humeral area of fulvous pubescence, elsewhere marmorate subtransversely with black and cinereous pubescence; body rather small and stout, the abdomen very densely clothed with white hairs, the black marginal spots very small; male with the third and fourth segments foveolate. Length 6.5-6.9 mm.; width 2.9-3.25 mm. Arizona; [*micoreus* Lec.].....**carnivorus Fabr.**
- Elytra uniform in color and uniformly clothed with a mixture of black and paler hairs; fourth ventral alone foveolate in the male, at least in *vulpinus*.....8
- 8—Elytra piceous, uniformly and rather sparsely clothed with a mixture of black and fulvo-cinereous hairs in almost equal proportions, dense whitish pubescence toward the sides of the pronotum not maculate at base; body elongate. Length 5.8-8.9 mm.; width 2.4-3.6 mm. Indiana, Florida, California and Guadalupe Island.....**vulpinus Fabr.**
- Elytra black, sparsely clothed with black hairs, among which longer yellowish-cinereous hairs are uniformly but sparsely intermingled; densely pubescent lateral area of the pronotum with a small rounded dark spot at base; body stouter and more oval. Length 7.5-8.5 mm.; width 3.5-3.75 mm. New Jersey, Virginia (Fort Monroe) and Iowa (Keokuk).....**frischi Aug.**
- 9—Pubescence throughout above and on the abdomen uniform and yellowish-cinereous, somewhat sparse, not concealing the sculpture, the abdomen without trace of quasi-denuded dark spots at any part; body very elongate, subparallel, the pronotum with two pronounced basal impressions and the elytra with feebly impressed longitudinal lines extending almost to the base. Length 8.9 mm.; width 3.6 mm. Indiana.....**elongatus Lec.**
- Pubescence, thoracic impressions and elytral lines as in *elongatus*, the vestiture of the abdomen even less conspicuous and dark fulvous in color, with two marginal and two discal series of rounded subdenuded spots, the two male foveolae small; legs not annulated; body shorter and less parallel-subcylindric than in *elongatus*. Length 7.5 mm.; width 3.3 mm. Florida (Key West).....**cadaverinus Fabr.**
- 10—Elytra densely cinereo-pubescent in basal two-fifths or more, each with three small nigro-pubescent points in transverse posteriorly arcuate series at or near basal fourth; male with two ventral foveolae.....11
- Elytra black, pale and fulvo pubescent at base for a short distance, not maculate; male with two ventral foveolae.....12
- Elytra piceous, uniform in color and vestiture throughout; male with a single ventral foveola on the fourth segment as in *vulpinus*.....13
- 11—Pronotum closely punctured throughout and uniformly clothed with blackish hairs, with small clusters of yellowish-cinereous hairs interspersed; basal pubescent area of the elytra not extending to the middle and sharply delimited, the hairs of the remainder being entirely black. Length 6.8-7.7 mm.; width 2.75-3.4 mm. United States and Europe.....**lardarius Linn.**
- Pronotum finely and sparsely punctured toward the middle, clothed uniformly throughout with longer fulvo-cinereous pubescence, the elytra rufo-piceous throughout,

the densely pubescent basal area extending well beyond the middle and not sharply defined, the pubescence of the remaining parts being in large part similar in color but sparser. Length 5.7-7.4 mm.; width 2.5-3.2 mm. Vancouver Island and New Mexico (Fort Wingate).....**signatus** *Loc.*

- 12—Body oblong-oval, more depressed than usual, pale rufo-ferruginous throughout above and beneath and clothed with rather sparse fulvous pubescence, the elytra black, except at the basal margin and along the sides to basal fourth or more, the black parts clothed uniformly with inconspicuous blackish pubescence; abdomen without quasi-denuded spots. Length 6.3 mm.; width 3.0 mm. Illinois. **pulcher** *Loc.*

- 13—Narrow and convex; body and legs throughout uniform dark piceous-brown in color, the pronotum rather finely, not very densely punctate, deeply and narrowly bisinuate at base, broadly bilimpressed at the basal margin, with rounded hind angles, the vestiture uniform throughout and consisting largely of fulvo-cinereous hairs; elytra clothed rather sparsely with dark pubescence, with fulvo-cinereous hairs sparsely and uniformly interspersed throughout; pubescence of the under surface denser and uniformly flavo-cinereous, the abdomen without quasi-denuded spots. Length 6.7 mm.; width 2.7 mm. Texas (El Paso).

angustus, sp. nov.

Sobrinus of LeConte, I have been unable to identify amidst the material accessible to me. *Rattus* and *signatus* are by no means varietal forms, but perfectly valid and very interesting species; *mannerheimi* seems, however, to be a variety of the very widely distributed *caninus*; it is wholly different from *marmoratus*, as I have previously pointed out (Bull. Bk. Ent. Soc.). The identity of *microcus* and *carnivorus* rests upon the authority of the Hanshaw List. Say described his *nubilus* from Florida and Pennsylvania, and the characters given coincide entirely with those of *caninus* and not with the more pubescent form named *nubipennis* above.

ATTAGENINI.

This is the largest tribe of the family, and contains a considerable number of genera having the legs more or less free throughout. The laminate portion of the hind coxæ extends about half way across the end of the parapleuræ; the epipleuræ are distinct and generally strongly defined toward base, and the prosternal process is visible, though generally narrow, between the coxæ, its free tip resting in an apical pit of the mesosternum which is frequently prolonged to the apex of the latter as a well-defined sulcus or fossa. The antennæ are of varied structure, and the antennal fossa may be traced in successive stages of development through the genera in an instructive and interesting manner. In the first four or possibly five genera of the tribe,

the hypomera are merely flat or concave, without trace of an enclosed antennal fossa, but in *Trogoderma* the fossa appears in one of its primitive stages, and may be conceived to be the result of retractility of the anterior femora. The crural fossae are deep and defined anteriorly by a strongly elevated acute cariniform line, extending obliquely to the hind angles of the prothorax, and forming the posterior boundary of the hypomeral concavity. To suggest that this latter concavity has not been evolved primarily as a shelter for the antennae as in *Anthrenus*, for example, it may be observed that it is equally large and well formed in both sexes, although the antennae differ sexually to a great degree, and it is only in the male that it is in any way completely utilized or compactly filled by that organ; in the female, where the antennae are comparatively very feebly developed, these organs lie in repose along the bottom of the concavity, which is much too large to form a secure shelter. In *Trogoderma* the fossa occupies the entire length of the prothorax, but in *Cryptorhopalum* while having a general form which undoubtedly betrays a development from that of *Trogoderma*, it has become smaller and forms a secure shelter for the antennae, these having become similar in the sexes and assuming a form so radically different from those of *Trogoderma* that it is difficult to trace any philogenetic relationship, and in *Thaumateglossa*, the modification is carried still further, the two closely connected club-joints of *Cryptorhopalum* becoming a single very large joint. *Acolpus* appears to be a very satisfactory intermediate between the non-fossate genera and *Trogoderma*, and it is possible that more careful observation may there show the antennal fossa in a still more incipient stage of formation. The American genera may be defined as follows:—

- Basal joint of the hind tarsi very short, much shorter than the second; antennal fossa not defined; legs free, the hind femora retractile as usual.....2
- Basal joint elongate, generally but little shorter than the next two combined; antennae 11-jointed in both sexes.....3
- 2—Antennae 11-jointed in both sexes, the two basal joints of the male club short and transverse, the last greatly elongated; mesosternum between the coxae longer than wide, not sulcate, the anterior coxae narrowly separated; metacoxal lamina greatly elongated internally.....**Attagenus**
- Antennae 10-jointed in the male, 11-jointed in the female, the two basal joints of the male club much elongated and the last joint relatively much less so; mesosternum between the coxae very narrow and elongate, not sulcate, the prosternal process extremely narrow; metacoxal lamina as in *Attagenus*, the epipleurae less inflexed and less strongly defined; body with denser and more variegated pubescence.....**Novelsis**

- Antennæ 9-jointed in both sexes, the club oval, compact and dilated in the male, with its two basal joints very short and transverse; mesosternum between the coxæ rather narrow, divided longitudinally throughout by a narrow shallow sulcus; anterior coxæ narrowly separated; hypomera feebly concave anteriorly; metacoxal lamina short, gradually and very slightly longer internally; epipleuræ narrow but distinct.....**Dearthrus**
- 3—Hypomera indefinitely concave as usual, without antennal fossa.....4
- Hypomera with a deep concavity which is well defined internally by acute edges...5
- 4—Antennal club 3-jointed in both sexes, formed nearly as in *Attus* but with the last joint less elongate in the males; mesosternum between the coxæ moderately narrow, divided throughout by a very shallow longitudinal impression and deeply emarginated behind by the tip of the metasternal process; anterior coxæ rather narrowly separated; epipleuræ strongly defined; metacoxal lamina scarcely at all longer internally.....**Perimegatoma**
- Antennal club of the male 6-jointed and serriform, nearly as in *Trogoderma*; hypomera concave; metacoxal plates only attaining the parapleuræ; mesosternum as in *Trogoderma* [Jayne].....**Acolpus**
- 5—Antennæ stout, claviform and usually serrate in the male, with the subbasal joint small, generally very small and with a narrow 4-jointed club in the female; mesosternum very short and wide between the coxæ and completely divided longitudinally by a deep broad sulcus; anterior coxæ rather narrowly separated; metacoxal lamina short, gradually, feebly and rectilinearly longer internally, as in *Dearthrus*; epipleuræ rather feebly inflexed and not coarsely delimited; anterior femora retractile, the crural cavities separated from the antennal fossæ by a thin cariniform interval.....**Trogoderma**
- Antennæ with a large oval and compactly 2-jointed club, securely and closely fitting in repose within deep fossæ, which are separated by a flat interval from the crural cavities in both sexes; mesosternum as in *Trogoderma*, the anterior coxæ more widely separated; epipleuræ feebly inflexed, rather well defined; metacoxal lamina short, with its hind margin transverse.....**Cryptorhopalum**
- Antennæ with a male club consisting of a single very large subsecuriform joint, closely fitting in repose within hypomeræ fossæ; remaining characters nearly as in *Cryptorhopalum*; [*Axinocerus* Jayne].....**Thaumatoglossa**

If the metacoxal plates only attain the parapleuræ in *Acolpus*, as stated by Jayne, this genus forms a remarkable exception to the entire tribe, and I strongly suspect that the author is mistaken. Neither this genus nor *Thaumatoglossa* is represented before me at present, and I am therefore unable to consider them below. The species are all pubescent, generally with nubilous variation in density, usually elongate or oblong-oval in form and of less compact build than in the Anthrenini or Orphilini, but similar in this respect to the Dermestini and Trinodini.

Attagenus Latr.

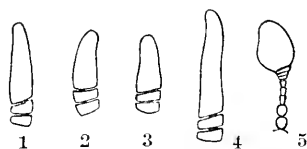
The prosternal process is wider between the coxæ than in *Novelsis*, though still very narrow, and the species are larger, stouter, more oblong and almost uniformly clothed with rather sparse dark and inconspicuous pubescence. The species are somewhat numerous but closely allied among themselves, those forms which are apparently worthy of distinctive names may be defined as follows:—

- Elytra deep black throughout, the head and pronotum concolorous.....2
 Elytra rufous to piceous-black in color, the anterior parts frequently darker than the elytra.....4
 2—Elytra each with a small spot of white pubescence at the middle of the length and at inner fourth of the width; pronotum with three small and widely separated areas of pale pubescence at base; third joint of the male antennal club black, as long as the entire remainder of the antenna and rather more than four times as long as the two basal joints of the club combined. Length 4.0 mm.; width 2.0 mm. Rhode Island.....**pellio** Linn.
 Elytra without paler pubescence at any part; pronotum without pale hairs at the base.....3
 3—Pronotum coarsely and closely punctate, without subbasal impressions; antennæ of the male nearly as in *pellio*; pubescence fulvo-piceous in color. Length 3.3–4.0 mm.; width 1.6–1.9 mm. Indiana and California; [*megatoma* Fabr.].
piceus Oliv.
 Pronotum very finely and less closely punctured, with three widely separated subbasal impressions; body more broadly oblong-oval, shining; legs piceous, the tarsi ferruginous, pubescence blackish; last joint of the female club more than one-half longer than the two preceding combined; male not observed. Length 3.8 mm.; width 2.0 mm. Idaho (Cœur d'Alène).....**schæfferi** Herbst
 4—Pronotum not impressed, or clothed with paler pubescence along the basal sinuations.....5
 Pronotum feebly impressed along the broadly rounded basal sinuations, the impressed margin clothed with finer and pale pubescence.....9
 5—Entire upper surface dark piceous-brown to piceous-black in color; pronotum with a feeble subbasal impression before the scutellum.....6
 Elytra bright red, sometimes narrowly infusate along the suture, the head and pronotum black and much more closely punctured, the ante-scutellar impression not visible.....8
 6—Last joint of the male antennal club black, about as long as the entire preceding part of the antenna, which is testaceous, and slightly more than three times as long as the two preceding joints combined; body moderately stout, oblong-oval, legs ferruginous throughout. Length ♂ 3.2, ♀ 3.7 mm.; width ♂ 1.7, ♀ 1.85 mm. Pennsylvania.....**extricatus**, sp. nov.
 Last joint of the male antenna much shorter than the entire preceding part.....7
 7—Male club stout, the last joint two and one-half times as long as the two preceding combined; prothorax of the male fully twice as wide as long. Length ♂ 3.25, ♀ 3.4–3.7 mm.; width ♂ 1.6, ♀ 1.65–1.85 mm. New York, District of Columbia and Virginia (Norfolk).....**deficiens**, sp. nov.

- Male club relatively still shorter, the last joint but slightly more than twice as long as the two preceding combined; prothorax less transverse and less strongly and densely punctured, not quite twice as wide as long, the male narrower and the female larger than in *deficiens*. Length ♂ 2.8-3.1, ♀ 3.8-4.5 mm.; width ♂ 1.4-1.65, ♀ 2.0-2.4 mm. Iowa (Keokuk) and Nebraska; [*sparsus* Lec., *floricola* and *obscurus* Mels., i. lit.].....***cylindricornis*** Say
- 8—Body narrowly oval or oblong-oval, the head and pronotum strongly and moderately closely punctured, the elytra unusually sparsely and much less coarsely so; hypomera but feebly concave; last joint of the male antennæ black, longer than the entire preceding part and four times as long as the two preceding joints combined; female club black; under surface picous, the legs ferruginous throughout. Length ♂ 2.9, ♀ 3.6-4.1 mm.; width ♂ 1.35, ♀ 1.7-2.1 mm. California to Utah.....***rufipennis*** Lec.
- 9—Head and pronotum generally blackish-piceous, the elytra rufous, the entire body sometimes testaceous; hypomera deeply concave; punctures moderately dense, those of the pronotum finer than the elytral; male club very elongate and slender, the last joint contorted distally, longer than the entire preceding parts. Length ♂ 3.2, ♀ 4.9 mm.; width ♂ 1.65, ♀ 2.4 mm. Iowa (Keokuk); [*dichrous* Lec.].....***bicolor*** G. & H.
- Head and pronotum blackish, the elytra somewhat, but not very noticeably, paler piceo-rufous; in body and antennæ nearly similar to *bicolor*, the former obviously narrower and relatively more elongate-oval. Length ♂ 2.9-3.4, ♀ 4.4 mm.; width ♂ 1.4-1.7, ♀ 2.1 mm. Nebraska to Utah.....***elongatulus***, sp. nov.

As may be inferred from the detailed measurements given in the table, the female is generally very much larger than the male, but in *extricatus* and *deficiens* there is greater equality in this respect, judging from the material accessible to me. The discriminative work hitherto bestowed upon this comparatively monotonous, and consequently less interesting, genus, has been very superficial, and detailed study of the male antennæ reveals a variety of structure too great apparently to be the result of fortuitous variation; some of the names proposed by LeConte must therefore be restored to specific weight; *rufipennis* is, in fact, quite isolated as a species—more so than *pellio* when compared with *piceus* for example. The diagrams given in the accompanying cut will serve to show some of the variations in the club of the male antennæ, and, although some variability in an organ so over-developed is to be expected, it will be probably granted that such extreme variations,

FIG. 3.



1, Antennal club of *Attagenus extricatus* ♂; 2, same of *A. cylindricornis*; 3, same of *A. deficiens*; 4, same of *A. elongatulus*; 5, antenna of *Dearthrus longulus*.

especially when accompanied by differences in the form, color and sculpture of the body, must, until further evidence, be held to have specific weight.

Novelsis, gen. nov.

This genus is comparatively local, occurring only in the Sonoran provinces, and is distinguishable at once from *Attagenus* by the structure of the antennal club and hypomera and the 10-jointed male antenna as well as by the complex vestiture. The few species before me may be identified as follows:—

- Hypomera nearly horizontal, not concave and with the outer edge rather obtuse and not at all descending; mesosternum very narrow between the coxae. [**Novelsis**, in sp.] 2
- Hypomera concave and strongly descending, the outer edge very acute; mesosternum wider between the coxae. [**Paranovelsis**, sg. nov.] 6
- 2—Elytra without distinct paler pubescent maculation behind the middle 3
- Elytra with transverse paler pubescent spots or bands in apical half 5
- 3—Elytra with the suture, external margin in basal two-fifths, and an oblique line connecting the latter with the pale sutural line at basal third or less, pale testaceous and clothed with coarser fulvo-cinereous hairs, the remainder blackish and clothed with shorter blackish pubescence; head and pronotum blackish, the basal margin of the latter testaceous; last joint of the male antennal club much longer than the preceding. Length 3.2 mm.; width 1.5 mm. Arizona... **horni** *Jayne*
- Elytra piceous to testaceous in color and almost uniform throughout, the pubescence dense and less variegated, a condensed oblique spot near basal third generally more or less distinct 4
- 4—Subbasal spot of condensed cinereous pubescence posteriorly angulate at inner third or fourth of the width; body stouter; sides of the prothorax strongly convergent and distinctly arcuate. Length 2.7-3.4 mm.; width 1.55-1.75 mm. Arizona. **byturoides**, sp. n. (Cr. MS)
- Subbasal spot straight and oblique, frequently suffused and indistinct; body narrower and much smaller in size, the prothorax less narrowed at apex, the sides very broadly and feebly arcuate from base to apex; last joint of the male antenna three times as long as wide and distinctly shorter than the two preceding combined. Length 2.4-2.65 mm.; width 1.15-1.35 mm. Utah (southwestern)—Mr. Weidt.
- uteana**, sp. nov.
- 5—Body narrow and elongate-oval, convex, piceous-black above and beneath, the legs testaceous; pubescence very dense, rather short, subdecumbent, the longer semi-erect hairs not conspicuous, uniform, brownish-cinereous on the pronotum and pale areas of the elytra, of which there is, on each, a large transverse basal spot, an oblique fascia between basal third and fourth, separated from the spot by a short transverse darker interval, a narrow and irregularly sinuous transverse band near apical third, and a straight transverse fascia very near the apex prolonged to the apical angles along the suture; male antennal club extremely long, the last joint nearly as long as the two preceding combined and as long as the

width of the head. Length 3.25 mm.; width 1.65 mm. Arizona (Riverside)—

Mr. Wickham **picta**, sp. nov.

- 6—Body much broader, oblong-oval, more sparsely pubescent, the sub-erect hairs longer, abundant and conspicuous; elytra piceous, variegated with paler and with three transverse fasciæ of pale hairs, the second usually divided into two spots on each elytron, and the third broadly interrupted at the suture, also with a spot of paler pubescence at each side of the scutellum. Length 3.4 mm.; width 1.8 mm. Arizona **varicolor** Jayne

Perplexa of Jayne, I have not seen, but it is evidently allied to *byturoides*, differing in the relatively shorter last joint of the antennal club. *Byturoides* was considered by Dr. Jayne as the female of *horni*, but this is not the case, as I have both male and female of that species as well as the allied *utana*.

Novelsis differs from *Lanorus* in antennal and hypomerai structure, and from *Telopes* in the structure and armature of the legs in addition.

Dearthrus Lec.

This genus is allied to *Attagenus* but differs in having the meso-sternum completely divided by a narrow shallow sulcus, in the 9-jointed antennæ and in the shorter, less inwardly postero-extended metacoxal lamina. The single species may be defined as follows from the male:—

Narrowly oblong-oval, moderately convex, piceous-black in color; prothorax twice as wide as long, strongly narrowed from base to apex, with the sides evenly and feebly arcuate, the base broadly and feebly lobed, feebly oblique and sinuate laterally, the surface rather strongly but not densely punctate, with a fine excavated median line not attaining base or apex; elytra three-fourths longer than wide, rather strongly but not very closely punctured; under surface black, the legs rufo-piceous; pubescence throughout dark in color, uniform, short and not conspicuous; antennæ as figured under *Attagenus*. Length 2.4 mm.; width 1.15 mm. Indiana..... **longulus** Lec.

Apparently rare; I have before me only a single specimen in rather poor state of preservation.

Perimegatoma Horn.

In this exclusively western genus, which belongs to an important section of the *Attagenini* differing from those above considered in the elongate basal joint of the tarsi, the antennal club is 3-jointed, with its two basal joints transverse and the last elongate, though to a less degree than in *Attagenus*. The prosternum is strongly deflexed at tip to form a protection to the mouth in repose, as in most of the other

genera of the family, the process between the coxæ moderately narrow, the mesosternum narrow and divided throughout by a relatively wide parallel sulcus. The hypomera are moderately and indefinitely concave, and the metacoxal lamina short. *Belfragei*, which is assigned to the genus by Jayne, undoubtedly forms the type of a distinct genus because of the 5-jointed antennal club; it is therefore not considered in the following table, which comprises all the species known to me:—

- Last joint of the male antennal club short, scarcely one-half longer than the two preceding combined.....2
 Last joint much longer, nearly twice as long as the two preceding; body narrower...9
 2—Last joint conical, pointed at apex.....3
 Last joint ovo-conoidal, rounded at apex.....8
 3—Body in great part black or picuous-black in color.....4
 Body wholly rufo-ferruginous, stout.....7
 4—Pubescence rather persistent; zig-zag testaceous bands at basal third and apical fourth very narrow and frequently indistinct.....5
 Pubescence readily denuded, the rufous bands very wide, the anterior broadly interrupted at the suture.....6
 5—Vestiture rather fine, largely black, the suberect bristle-like hairs rather inconspicuous; clytral punctures close-set; body moderately stout. Length 3.5–4.6 mm.; width 1.65–2.1 mm. California (San Francisco to Calaveras).

jaynei, sp. nov.

- Vestiture much coarser, the sub-erect bristles conspicuous, the hairs sparser, largely fulvous and whitish, the darker much less numerous; body less stout and more elongate, the clytral punctures sparse. Length 4.0 mm.; width 1.0 mm. Guadalupe Island**guadalupensis**, sp. nov.

- 6—Black areas of the elytra clothed with nearly uniform short blackish pubescence, the rufous bands with sparse uniform fulvous hairs; body broad, feebly convex, oblong, the clytral punctures rather fine and sparse. Length ♂ 3.0, ♀ 6.0 mm.; width ♂ 1.7, ♀ 2.8 mm. California.....**ampla** sp. nov.

- 7—Oblong-oval, convex, the vestiture short but abundant, much variegated, in great part fulvous and white, the suberect black bristles distinct, the white hairs generally forming a distinct cluster at basal and inner third and three detached spots at apical fourth in the zig-zag paler band. Length 4.7 mm.; width 2.2 mm. California**variegata** Horn

- 8—Body rather narrowly oblong-oval, moderately convex, black, the elytra rufous along the lateral edges and rufo-picuous in two narrow obscurely evident bands at the usual positions, the vestiture persistent, nearly as in *jaynei*, but with the whitish hairs more abundantly interspersed. Length 3.4 mm.; width 1.5 mm. Nevada (Reno).....**nevadica**, sp. nov.

- 9—Body black, the elytra with the usual two rufous bands clothed with paler, denser and more persistent pubescence, the latter elsewhere readily denuded, the anterior pale areas more impressed than usual; punctures of the elytra fine but deep, perforate as usual and somewhat sparse; prothorax about twice as wide as long in the male. Length 3.6 mm.; width 1.5 mm. Utah (southwestern)—Mr. Weidt.....**impressa**, sp. nov.

Body black, more depressed, the elytra more strongly and closely punctured, without distinct rufous areas, almost evenly clothed with subdecumbent fulvous pubescence, with very narrow and scarcely noticeable zig-zag bands of more cinereous hairs in the usual positions; prothorax of the male more transverse, more than twice as wide as long; under surface black, the legs and antennae piceous-black. Length 3.65 mm.; width 1.5 mm. Wyoming (Laramie)...*monticola*, sp. nov.

Cylindrica of Kirby (Saskatchewan), and *angularis* Mann., (Alaska), are not known to me at present, the former is said to be distinguished by its uniform elytral vestiture and was assigned by Kirby to *Attagenus*; it was considered to be the same as *picus* by Gemminger and Harold, but is probably different, as it is said by the author to resemble a *Cryptophagus*. The *Attagenus angularis* of Manerheim, seems by the description to be uniformly pubescent, except toward the hind angles of the prothorax, where the hairs become whitish and condensed; it cannot be the same as *jaynei*, of the above list, which latter was considered to be *cylindrica*, var. C, by Horn. The *falsa* of Horn, is evidently a rare and local species, entirely unknown to me, having the male antennal club slightly longer than the funicle, with its first joint "extremely short"—language which will not apply to any other species known to me—and the last joint more than twice as long as the two preceding together and pointed at tip; it occurs at and near Sta. Barbara, California.

The pronotum throughout the genus is coarsely and very closely punctured, and there are generally two small and very shallow sub-basal fovea at outer fourth, in which the punctures become still more crowded and coalescent. The species are difficult to identify, as there is a strong mutual resemblance throughout. *Ampla*, however, is a very striking species, differing enormously in the relative size of the sexes; the females are the largest by far of the entire genus. Generally the divergence of the sexes in this respect is not quite so noticeable as in *Attagenus*, although the paucity of material before me will not allow of definite statement in this regard.

Trogoderma Latr.

In this genus the body is oblong-oval, less elongate than in *Perimegatoma* but almost similarly clothed with variegated pubescence. The species described by Dr. Jayne under the name *Trogoderma simplex*, seems to have a somewhat unusual construction of the side pieces of the prosternum, and it should therefore form the type of a distinct genus; it is unknown to me.

The antennæ are of a different type of structure from that prevailing elsewhere in the tribe, the club being 6- to 8-jointed and generally loose and serriform in the males, and 4-jointed and regular in the females. The prosternum is not so strongly deflexed at apex as in *Perimegatoma*, and the process between the coxæ is wider, the mesosternum between the coxæ very much wider, transverse and divided throughout by a broad deep sulcus.

Dr. Jayne was mistaken in his diagnosis of the species of the *sternalis* group in two important particulars. The mesosternum is as completely and widely divided by the median sulcus as in the others, but the metasternal process is rather more arcuate, and the broad flat marginal bead usually extends along the apex throughout the width; this misled the author in determining the true anterior limit of the metasternum. The author also failed to observe the true structure of the male antennæ, the very minute third joint giving rise to the appearance of a 10-jointed condition, which is alluded to as a general fusion of the tenth and eleventh joints in the male (Proc. Am. Phil. Soc., XX, p. 363).

The species are quite numerous and those before me may be thus briefly characterized:—

Eyes entire, the inner frontal margin not sinuate; antennæ serrate in the male	2
Eyes sinuato-emarginate at about the middle of their inner frontal edge; male antennæ compact, not serrate, the third and fourth joints subequal and transverse; pronotum minutely, sparsely punctate, becoming strongly and more densely so toward the sides.....	14
2—Male antennæ with the third and fourth joints equal in size.....	3
Male antennæ having the third joint minute and very much smaller than the fourth.....	10
3—Body more elongate in form, the elytra nearly one-half longer than wide.....	4
Body stout and broadly oblong-oval, the elytra one-fourth longer than wide or even less.....	9
4—Submedian testaceous band of the elytra crossing the suture at the middle of the length; species small and inhabiting the Eastern and Gulf States.....	5
Submedian testaceous band crossing well behind the middle of the length; species much larger and inhabiting the Pacific States.....	8
5—Pronotum strongly and rather closely punctate, especially toward the sides; pubescence persistent.....	6
Pronotum very minutely and sparsely punctate throughout, the pubescence readily denuded.....	7
6—Elytra black, with the usual pattern of fine irregular rufescent bands clothed with paler hairs; vestiture of the pronotum much variegated. Length 3.0 mm.; width 1.65 mm. Iowa (Keokuk): [<i>pusilla</i> Lec.].....	ornata Say
Elytra and pronotum almost similarly colored, and with the variegated pubescence	

nearly similar but finer, the subapical irregular band emitting a fine spur anteriorly at inner two-fifths; body narrower; club of the male antennæ beginning with the fourth joint. Length 2.0 mm.; width 1.45 mm. Texas, **serriger**, sp. nov.

- 7—Body nearly similar in ornamentation and color to the preceding, the basal lobe of the pronotum not so distinctly marked with white pubescence; serrate antennal club of the male beginning with the sixth joint. Length 1.6–2.7 mm.; width 0.8–1.3 mm. Massachusetts, New York (Long Island) and Virginia (Norfolk).

tarsalis *Muls.*

- 8—Body large, elongate oval, black, the elytra with irregular anastomosing bands of testaceous nearly as in the preceding, the pale vestiture of the rufous areas rather long and fulvous, that of the black areas short, dark and inconspicuous; pronotal punctures fine and sparse, those of the elytra coarser but sparse; legs ferruginous throughout. Length 4.0 mm.; width 2.0 mm. California.

pollens, sp. nov.

- 9—Epileure of the elytra flat; body stout, black, the elytra variegated with paler areas which are clothed with paler pubescence, nearly as in the preceding species; pronotum in the female not quite twice as wide as long, rather strongly but sparsely and evenly punctured throughout, the sides moderately convergent. Length 2.7 mm.; width 1.6 mm. Texas,.....**complex**, sp. nov.

Epileure deeply concave; body in coloration and sculpture nearly as in *complex*, the pale areas of the elytra larger and more suffused and the variegated vestiture shorter; pronotum in the female much more transverse, more than twice as wide as long, the sides very strongly converging from base to apex; legs pale, the femora black. Length 3.2 mm.; width 1.78 mm. California (Shasta Co.)

variipes, sp. nov.

- 10—Pronotum minutely punctate, the punctures simple and perforate. Pacific Coast..... 11

Pronotum strongly and closely punctate, the punctures simple and perforate. Atlantic and Sonoran..... 12

Pronotum strongly but sparsely punctate, the punctures rugose. Sonoran..... 13

- 11—Body black, the elytra with broken transverse paler bands clothed with the usual paler pubescence, the sutural portions of the submedian band far in advance of, and detached from, the lateral portion; prothorax of the male with the median lobe of the base rather broadly rounded, the sides evenly convergent and broadly, almost evenly arcuate from base to apex. Length 2.4 mm.; width 1.2 mm. California,.....**sternalis** *Jayne*

Body as in the preceding, the submedian band of the elytra finer, almost continuous, the sutural crossing but little more advanced than the lateral part; basal lobe of the prothorax smaller, more narrowly rounded and more abruptly formed, the sides strongly rounded basally, becoming thence much more strongly convergent and almost straight to the apex in the male, the base somewhat wider than the base of the elytra; size very small. Length 1.8 mm.; width 1.0 mm. California (Los Angeles.).....**simulans**, sp. nov.

- 12—Body black, with variegated white and fulvous bands nearly as in *sternalis*, the sutural part of the submedian band far in advance of the lateral angulation and detached from it; prothorax at base equal in width to the elytra, very strongly transverse, in the male distinctly more than twice as wide as long, the sides very

strongly convergent toward apex, more rounded toward base. Length 2.65 mm.; width 1.4 mm. Virginia [Fort Monroe].....**virginica**, sp. nov.
 Body black and with variegated pubescence nearly as in the preceding species, the submedian band of the elytra almost continuous, transverse, the sutural part not much in advance of the lateral, forming a broad even arc in more than inner half of each elytron; prothorax of the male much less transverse, scarcely twice as wide as long, the sides less convergent and more even in curvature; size much smaller. Length 2.2 mm.; width 1.18 mm. Texas [El Paso].

oblongula, sp. nov.

13—Body black, with variegated white and fulvous elytral bands nearly as in *virginica*, except a distinct sutural rhombus included within the subapical band, which is wanting in that species, the submedian band much broken; prothorax at base not quite as wide as the elytra in the female, the punctures deep, well separated and strongly annulo-rugose, much less than twice as wide as long; elytral punctures rather strong but twice as sparse as in *virginica*, the pubescence very much sparser than in that species or *oblongula*. Length 2.5 mm.; width 1.3 mm. Arizona.

aspericollis, sp. nov.

14—Form very short and broad, oblong, the elytra in both sexes scarcely a fourth longer than wide.....15

Form narrower and more elongate in both sexes, the pattern of elytral ornamentation obsolete or partially so.....16

15—Elytra black, with narrow anastomosing paler bands nearly as in *ornata*, which are clothed sparsely with whitish hairs, the subapical transverse band enclosing a transverse rhombus on the suture; elytral punctures sparse and rather fine; prothorax of the female twice as wide as long, the sides evenly and moderately arcuate. Length 2.9 mm.; width 1.7 mm. Pennsylvania; [*pallipes* Zieg.].

inclusa Lec.

Elytra as in the preceding, with the pale anastomosing markings broader and clothed in great part with fulvous pubescence, the punctures somewhat stronger and slightly less sparse, the subapical band not forming a distinct sutural rhombus; hairs of the pronotum sparse, suberect and black, becoming paler laterally toward base; prothorax of the male more than twice as wide as long. Length 2.3 mm.; width 1.35 mm. California (San Francisco).....**brevis**, sp. nov.

16—Elytra parallel and feebly arcuate at the sides, rounded and narrowed only at the apex, black, with a narrow testaceous bisinuate band clothed with paler pubescence near the base, and a few small spots of pale pubescence posteriorly, notably one on each at the suture at the middle, and at the side slightly behind the middle of the length, and one at the middle of the width at apical fourth. Length 2.4 mm.; width 1.28 mm. Indiana?—Cal. Levette.

obsolescens, sp. nov.

Elytra narrowed slightly from the rather pronounced humeral swelling to the rounded apex; body pale testaceous throughout, the head and pronotum slightly piceous; pubescence sparse and not at all varied, pale in color; surface of the elytra rugose, sparsely punctate. Length 1.9 mm.; width 0.9 mm. Arizona.

advena, sp. nov.

Unlike nearly all the other genera of Dermestidæ, the present seems

to be very rare in individuals, and it is seldom that more than a single one it taken at any one time: most of the species, which appear however to be abundantly distinct among themselves, are therefore represented at present by unique types. *Perimegatoma* resembles it in this respect to some extent. The pale coloration of *advena* may be due to immaturity, at least partially. In the adjoining diagram the antenna of *advena*, which is representative of that entire section of the genus, is drawn in a contracted state, but the insect has the power to separate the joints slightly, when they are seen to be deeply concave at their apices: they are mutually attached by short stipes or pedicels as in the others, but differ in being virtually symmetrical and not eccentric. These antennal differences, although marked, are not indicative of subgeneric groups, as the general structure of the under surface, and particularly of the hypomera, is identical throughout.

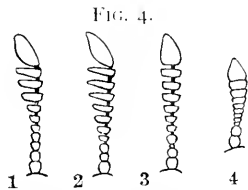


FIG. 4.
1 Antenna of *Trogoderma tarsalis* ♂, 2 same *T. serriger*, 3 same of *T. oblongula*, 4 same of *T. advena*.

Cryptorhopalum Guér.

The body in this genus, which is the most extensive of the American Dermestidae, becomes more oval and compact than in any other of the present tribe, but in anatomical structure it is evidently homologous with *Trogoderma*. The species are small to quite minute in size, of sober color and generally uniformly clothed with short dark pubescence, which, in some forms, becomes slightly variegated as in most of the other genera. The species before me are the following:—

- Pubescence of the elytra variegated.....2
- Pubescence uniform throughout.....9
- 2—Elytra with irregular or interrupted transverse bands of dense paler pubescence...3
- Elytra without transversely fasciate pubescence, but with a spot of dense pale and coarser hairs near the apex of each; last ventral of the female unmodified.....8
- 3—Last ventral segment of the female with two small, widely separated and rounded discal erosions; elytra not paler posteriorly.....4
- Last ventral of female with two small, rounded, flat and entirely unexcavated scar-like spots; elytra paler in apical third.....7
- 4—Pubescence of the pronotum dusky, sparse and inconspicuous but becoming pale and conspicuous toward the sides and on the basal lobe.....5
- Pubescence of the pronotum uniform or nearly so, coarse, denser, pale and conspicuous throughout.....6

- 5—Pale pubescent bands of the elytra at basal and apical third entire, the anterior irregular, the posterior narrowly interrupted at the middle; body narrowly oval, more or less pale piceo-testaceous in color, finely punctate, the pronotum minutely and sparsely; tarsi very slender, the posterior as long as the tibiae in the female and distinctly longer in the male; antennal club of the latter stout, not twice as long as wide, the second joint slightly shorter than the first. Length 1.9–2.25 mm.; width 1.1–1.3 mm. California (Sta. Barbara).....**filitarse**, sp. nov.
- Pale pubescent bands subentire but composed of short, sparse hairs and mutually separated by a distance equal to that of the anterior band from the base; body castaneous, sparsely punctured; legs testaceous, the femora piceous; posterior tarsi slightly shorter than the tibiae; antennal club of the female rather small, stout, one-half longer than wide, with the second joint distinctly longer than the first—a reversal of the general rule. Length 2.15 mm.; width 1.3 mm. New Mexico (Fort Wingate—Dr. Shufeldt).....**reversum**, sp. nov.
- Pale pubescent bands broken up into small sparse spots, a spot also behind the humeri and another near the apical angle of each elytron; body much larger, elongate-oval, darker in color, castaneous, the punctures a little coarser and rather more close-set than in *filitarse*; hind tarsi nearly similar. Length 2.5–2.65 mm.; width 1.4–1.55 mm. Arizona (Cañon of the Colorado River)—Dr. T. Mitchell Prudden.....**pruddeni**, sp. nov.
- 6—Elytra feebly narrowed posteriorly from the humeral callus, the pale pubescent bands cinereous and almost entire, separated mutually by a distance which is equal to that of the anterior band from the basal margin; apical spot of pale pubescence concolorous or nearly so, the spots and bands rather poorly defined, and with the pubescence largely cinereous toward base throughout the width, joining the first band at the suture; hind tarsi quite distinctly shorter than the tibiae in the female. Length 2.65 mm.; width 1.6 mm. Arizona.....**balteatum** Lec.
- Elytra rapidly narrowed behind from the humeral callus, the apex more narrowly rounded, body smaller, convex, and relatively stouter, castaneous in color, the bands of coarser pale yellowish-cinereous pubescence narrower, subentire and better defined, the two mutually much more distant than the first from the base, the apical spot fulvous in color; basal regions with a large proportion of pale hairs; hind tarsi very slightly in the male, distinctly in the female, shorter than the tibiae; male antennal club stout, not twice as long as wide, the second joint a little shorter than the first, the cavities extending to basal third. Length 1.9–2.25 mm.; width 1.2–1.4 mm. Texas (Brownsville)—Mr. Wickham.
festivum, sp. nov.
- 7—Body oval, blackish, the elytra rufous in apical third or more, with subhumeral annulus and two transverse bands of short, rather sparse pale hairs; pronotum with pale hairs toward the sides and basal lobe; joints of male antennal club subequal, the second but slightly shorter than the first, nearly similar, but a little smaller, in the female; tarsi slender and elongate. Length 1.8–2.5 mm.; width 1.2–1.5 mm. Missouri, Kansas and Texas.....**hemorrhoidale** Lec.
- 8—Rather broadly suboblong-oval, black, the elytra gradually and suffusedly rufescent toward tip, the pubescence short, dark, sparse and inconspicuous, becoming pale and distinct, though sparse, toward the sides and basal lobe of the pronotum and toward the sides, and more densely, near the apices, of the elytra; pronotal lobe

- rather broadly, rectilinearly truncate; legs testaceous, the femora blackish, except toward tip, the hind tarsi shorter than the tibiae; male antennal club extending three-fifths of the thoracic length, with the second joint three-fifths as long as the first, in the female smaller, with the second joint slightly shorter than the first. Length 2.0-2.8 mm.; width 1.23-1.8 mm. Oregon, California (Humboldt to San Diego) and Nevada (Reno).....**apicale** Mann.
- 9—Body broadly oval, the thoracic lobe broadly truncate; joints of the antennal club very unequal.....10
- Body more or less narrowly oval, the thoracic lobe much narrower.....11
- 10—Body deep black throughout, the elytral punctures sparse and coarse, the pubescence sparse, fine, blackish in color, uniformly distributed and very inconspicuous; antennal club of the male slender, two and one-half times as long as wide, extending to basal third, its second joint relatively very short, much less than half as long as the first, the latter twice as long as wide, of the female much smaller, extending to the middle, the second joint much shorter than the first. Length 2.1-2.8 mm.; width 1.4-1.8 mm. Arizona.....**dorcatomoides**, sp. nov.
- Body piceous-brown in color, the elytra coarsely and less sparsely punctured, the pubescence uniform, more abundant, short, coarse, fulvo-cinereous in color and distinct; male club not extending quite to basal third, the second joint more than half as long as the first, the latter not twice as long as wide. Length 2.5-2.7 mm.; width 1.6-1.7 mm. Texas (Austin).....**obesulum**, sp. nov.
- 11—Thoracic punctures sparse, at least toward the middle.....12
- Thoracic punctures rather close-set throughout.....16
- 12—Elytra coarsely, though rather sparsely, punctate. Sonoran and Pacific regions.....13
- Elytra very finely and rather less sparsely punctate. Atlantic regions.....15
- 13—Pubescence of the elytra longer, coarse, yellowish-cinereous and distinct; body very small, somewhat narrowly oblong-oval, black or piceous-black; male antennal club extending beyond basal third, elongate-oval in form, relatively large, more than twice as long as wide, the second joint three-fifths as long as the first, the latter much longer than all the preceding portion together, the funicle very short, not as long as the two globular basal joints combined. Length 1.65 mm.; width 1.0 mm. Arizona.....**granum**, sp. nov.
- Pubescence short, fine, dark in color and less conspicuous.....14
- 14—Body deep black in color, the elytral pubescence blackish and not at all fulvous; joints of the antennal club in the female less unequal, the second four-fifths as long as the first. Length 2.3 mm.; width 1.3 mm. Arizona.....**anthrax**, sp. nov.
- Body piceous-black, polished, sparsely punctured and unusually sparsely pubescent, the hairs fulvo piceous in color and more distinct; joints of the antennal club in the female very unequal, the second about two-thirds as long as the first, the latter longer than the entire funicle; legs ferruginous. Length 2.0-2.6 mm.; width 1.25-1.6 mm. California (Lake and Sonoma Cos.).....**affine**, sp. nov.
- 15—Narrowly oblong-oval, black or piceous-black, shining, the pubescence very short, dark in color and inconspicuous; antennal club pale as usual, large and evenly oval, in the male not twice as long as wide, the second joint very much shorter and narrower than the first. Length 1.73 mm.; width 1.0 mm. Georgia.

ruficorne Lec.

- 16—Pubescence coarse, pale, ashy-cinereous and distinct, rather sparse but denser toward the sides of the prothorax; elytra coarsely, rather sparsely punctured; male antennal club more than twice as long as wide, the joints very unequal, the second scarcely more than one-half as long as the first but only a little narrower, the first as long as the entire preceding parts, the funicle fully as long as the two basal joints combined; club of the female much smaller but with the joints unequal. Length 1.05–2.2 mm.; width 0.9–1.28 mm. Arizona (Benson).

fusculum *Lee.*

- Pubescence dark fulvo- or piceo-cinereous and less distinct.....17

- 17—Pronotal punctures moderately close-set but very fine, not dense and very inconspicuous. Sonoran regions.....18

- Pronotal punctures small but strong, dense and very distinct. California coast regions.....19

- 18—Pubescence fulvo-cinereous, coarser and distinct, moderately dense; body oval, black or piceous-black, less elongate; sides of the male pronotum strongly convergent and almost evenly arcuate throughout; antennal club rather dark brownish-ferruginous in color, narrowly oval and two and one-half times as long as wide in the male, with the second joint three-fourths as long as the first; hind tarsi distinctly shorter than the tibiae. Length 1.9–2.25 mm.; width 1.1–1.3 mm. Texas (Brownsville).....**modestum**, sp. nov.

- Pubescence finer, piceous and much less distinct; body black, narrower, more parallel; sides of the pronotum in the male strongly convergent anteriorly, subangulately rounded behind the middle and thence parallel and straight to the base, the edges more widely subexplanate; antennal club black or blackish, nearly similar in form in the male but with the joints less unequal, the second four-fifths as long as the first. Length 1.7–1.8 mm.; width 1.05–1.15 mm. Texas and Utah (southwestern).....**fusciclave**, sp. nov.

- Pubescence blackish, nearly as in the preceding but much denser; body black, stouter, the elytra coarsely and unusually closely punctured; legs ferruginous, the femora piceous; antennal club pale rufo-testaceous, the joints only slightly unequal in the female; hind tarsi about as long as the tibiae in the latter sex. Length 2.0 mm.; width 1.25 mm. Arizona.....**pumilum**, sp. nov.

- 19—Body narrowly oblong-oval, black, the elytra more closely punctured, the pubescence blackish, fine, rather dense but short and very inconspicuous; antennal club black or blackish, extending to basal fourth or fifth in the male, elongate-oval, with the second joint nearly four-fifths as long as the first; legs piceous, the hind tarsi slightly shorter than the tibiae, notably so in the female. Length 2.4 mm.; width 1.3 mm. California (Humboldt to Sta. Barbara); [*nigricorne* Lee.].....**triste** *Lee.*

There are a few other apparent species indicated by inadequate or poorly preserved material, and the genus is evidently a large one. In striking contrast to *Trogoderma*, individuals are abundant when discovered, and most of the species are represented by good series. The species *fusculum* of LeConte, which is entirely valid, is said by Dr. Jayne to inhabit the Atlantic regions: it is however Sonoran, and was

not correctly identified, and *triste* is not an Atlantic, but a Pacific, species. One female of *apicale* in my cabinet has the two joints of the antennal club equal in length : as it is not in very good condition, I cannot state whether it differs specifically. The remarks made by Dr. Jayne in regard to the female of *balteatum* are erroneous, as the antennal cavity is normal in form. The same author gives "California" as the locality of *ruficorne*, whereas it is confined in reality to the southern Atlantic States. *Picicorne*, described by LeConte from the southern Atlantic regions, is unknown to me, but is probably a valid species.

ANTHRENINI.

The distinguishing characters of this tribe are the compact body, very retractile legs and the deep and acutely defined fossæ for the antennal club. The tarsi are short and rather slender, the basal joint of the posterior distinctly shorter than the second, the next three subequal or progressively decreasing slightly in length. The mouth parts are completely protected in repose by the deflexed prosternum. The antennæ vary in the number of joints, but these divergencies do not indicate more than subgenera, as the structure otherwise is quite homogeneous. There is but one genus :—

Anthrenus Geoff.

The eyes may be sinuato-emarginate within or entire as in *Trogoderma*, and are finely faceted as usual. The prosternal process is rather narrow, impinging upon the transverse, deeply sulcate mesosternum, also as in that genus. The species are moderately numerous, and number among them some of the most destructive enemies of dried insects preserved in cabinets ; those before me may be easily identified as follows :—

Eyes emarginate ; antennæ II-jointed, the club broadly oboviform and composed of three closely connate joints of which the two basal are strongly transverse and much shorter than the last ; body clothed with broad scales. [<i>Anthrenus</i> in sp.].....	2
Eyes entire.....	6
2—Pronotum having a large well-defined lateral spot of pale scales not inclosing a darker spot.....	3
Pronotum with a large pale lateral spot, as above, but inclosing a small darker spot at nearly its central point. Pacific Coast.....	4
Pronotum clothed throughout with a mixture of white and brown scales. Sonoran regions.....	5

- 3—Elytra having the suture clothed throughout with whitish or rufescent scales, the vitta dilated laterally near base and apex and at the middle, also with a transverse area of pale scales just behind the middle and seldom attaining the sutural area, a subbasal and subapical marginal pale area and a basal ring at each side of the scutellum. Length 2.7–3.6 mm.; width 1.75–2.25 mm. New Jersey and Europe **scrophulariae** Linn.

Elytra similar but with a large uniform area of white scales extending from fourth to three-fifths from the base, and from the margin to inner third or fourth. Length 2.3–3.4 mm.; width 1.5–2.25 mm. Texas..... **thoracicus** Melsh.

- 4—Elytra clothed with black scales, with clearly limited areas clothed with whitish scales nearly as in *scrophulariae*, but with the sutural vitta generally interrupted at apical third and the transverse marginal spot behind the middle rarely extending beyond the median line, the oblique marginal fascia at basal third or fourth sometimes enlarged internally and forming with the basal sutural white regions a large irregular white spot covering a third of the entire area; pale scales of the elytra always white. Length 2.3–3.0 mm.; width 1.5–2.0 mm. California (Sta. Cruz and Lake Cos.)..... **occidens**, sp. nov.

Var. A—Similar to *occidens* but more narrowly oblong-oval, the scales of the subbasal sutural area yellow and not white; enclosed black spot within the lateral pale area of the pronotum very near the inner edge of the latter. Length 2.8 mm.; width 1.85 mm. Nevada (Reno)..... **nevadicus**, v. nov.

Var. B—Similar to *occidens*, except that the large subbasal area on the suture is clothed with dark fulvo-ferruginous scales, and the enclosed thoracic spots are composed of fulvous, and not black, scales, the formation nearly as in *lepidus* and its varieties. Length 2.5 mm.; width 1.7 mm. California **pictus**, v. nov.

- Elytra variegated nearly as in the preceding but with a sprinkling of brown scales; enclosed dark spot within the lateral white areas of the pronotum never black as in *occidens* but clothed with fulvous-brown scales; body smaller and less dilated. Length 2.25–2.5 mm.; width 1.6–1.7 mm. California (San Diego)

lepidus Lec.

Var. A—Body similar in form to the preceding, the pronotum less transverse, densely clothed throughout above with ochreo-fulvous scales, replacing the black scales of *occidens*; black scales wholly wanting at any part. Length 2.7 mm.; width 1.75 mm. California..... **obtectus**, v. nov.

Var. B—Similar to *lepidus* but with the scales of the paler areas more suffused and dispersed, the body more broadly oval, the prothorax larger, with the sides less convergent; antennae longer, the club broader. Length 2.4–2.7 mm.; width 1.6–1.8 mm. California (Lake Co.)..... **suffusus**, v. nov.

Var. C—Similar to *lepidus* but smaller and still narrower, the scales of the elytra black and fulvous, confusedly intermingled, with some feeble whitish sutural and external areas remindful of *lepidus*. Length 2.15 mm.; width 1.4 mm. California (San Diego)—Mr. Dunn..... **conspersus**, v. nov.

- 5—Broadly and evenly elliptical, convex, blackish-piceous, the legs paler; antennae moderate, ferruginous throughout; upper surface clothed with relatively very large white and brown scales, confusedly mottled on the pronotum and elytra, but with the white scales forming two tolerably distinct suboblique fasciae on the

- latter behind the middle; on the under surface white throughout. Length 1.8–1.95 mm.; width 1.15–1.25 mm. Texas (El Paso).....**parvus**, sp. nov.
- 6—Antennæ 11-jointed, the club subparallel, consisting of three connate joints, the two basal slightly transverse; scales elongate. [**Nathrenus**, sg. nov.].....7
- Antennæ 8-jointed, the club consisting of two closely connected joints. [**Florilus**].....8
- Antennæ 5-jointed, the club consisting of a single very elongate claviform joint. [**Helocerus**].....10
- 7—Oblong-oval, moderately convex, black, clothed with yellow, black and white scales, largely black on the median parts of the pronotum, the basal lobe always with whitish scales, the elytra with a transverse zig-zag pattern of pale scales, largely white bordered with yellow in two fasciæ. Length 1.8–2.8 mm.; width 1.25–1.75 mm. Europe and Eastern United States; [**varius** Fabr.]

verbasci Linn.

- Var A—Similar but more narrowly oblong-oval, the yellow scales still narrower, more elongate and more dispersed over the entire surface, the pattern of *verbasci* scarcely traceable and the scales more isolated among themselves. Length 2.2 mm.; width 1.3 mm. Virginia (Norfolk).....**pistor**, v. nov.
- Var B—Nearly similar to *verbasci* but larger and more broadly oblong, the yellow scales entirely covering the pronotum, the elytral pattern nearly similar but with the yellow scales more dispersed, the white patches similar in position but larger. Length 2.8–3.0 mm.; width 1.8–2.15 mm. Indiana.....**vorax**, v. nov.
- Var C—Almost similar to *vorax* but very much smaller, the yellow scales densely clothing the entire surface, except where replaced by the equally dense white scales in patches similar in position to those of *verbasci*; form more broadly rounded than in the European *nebulosus*; scales broader than in *verbasci*. Length 1.7–2.2 mm.; width 1.15–1.6 mm. Iowa (Keokuk).
- destructor** Melsh.
- Var D—Similar to *verbasci* but larger and more broadly oblong-oval, the zigzag pattern of the elytra equally well marked but with the post-median fasciæ more sharply anteriorly angulate near the suture, the surface when denuded showing feebly impressed longitudinal lines. Length 3.0 mm.; width 2.2 mm. Central America.....**substriatus**, v. nov.

- 8—Basal joint of the antennal club subquadrate, the second nearly twice as long as wide; body piceous, rather sparsely clothed with scales which are less decumbent, elongate and with oval cross-section and concave apices, the pale scales less numerous than the darker ones and irregularly disposed, the dark scales apparently flatter and more decumbent; elytral punctures fine but rather deep, moderately sparse. Length 2.9 mm.; width 1.75 mm. Europe.

museorum Linn.

- Basal joint much smaller, transversely obtrapezoidal, the second relatively shorter and but little longer than wide apparently in both sexes; scales less elongate, flatter, more decumbent and triangular, the punctures very shallow. America.....9
- 9—Antennal funicle moderately stout, the third joint about one-half as thick as the second; pale scales of the elytra strewn without order toward base but forming two somewhat evident transverse fasciæ behind the middle, the scales all broadly triangular and coarsely strigose; body castaneous in color, evenly and not very

broadly oval in form and strongly convex, much smaller than *muscorum*. Length 2.2 mm.; width 1.3 mm. Pennsylvania and Indiana, *castaneæ* *Melsh.*

Var A—Similar in color, form and size to *castaneæ* but with the scales more narrowly triangular, less coarsely strigose, the paler sparsely dispersed but forming a tolerably evident ring on each at base, very sparse behind the middle, though arranged in two more evident transverse areas nearly as in *castaneæ* but more widely separated. Length 2.25 mm.; width 1.35 mm.

North Carolina (Asheville) *carolinæ*, v. nov.

Var B—Similar in color to the preceding, the elytra a little paler; form much more narrowly oblong-oval, the surface more rugulose and alutaceous; pale scales as in *carolinæ* but much more abundant than in either of the preceding, scattered without order in basal half but with a large lateral condensation at basal third or fourth, the two transverse fasciæ behind the middle more evident. Length 1.9 mm.; width 1.2 mm. Texas,..... *angustulus*, v. nov.

Antennæ funicle very slender, the third and fourth joints scarcely a third as wide as the second; pale scales of the elytra very few in number and sparsely interspersed among the darker ones, more noticeably abundant at basal third or fourth, just behind the middle and near the apex; body shorter and more broadly rounded than in the preceding, castaneous in color, the tibiæ and tarsi testaceous; surface shining between the very minute sparse punctules. Length 2.0 mm.; width 1.4 mm. New York *rotundulus*, sp. nov.

10—Body oval and convex, nearly as in *castaneæ* in color, form and vestiture, the pale scales of the elytra forming on each a transverse fascia at basal fourth, curving forward internally to the scutellum, and forming two less evident transverse fasciæ behind the middle. Length 1.9–2.5 mm.; width 1.2–1.4 mm. Europe; [*clariger* Er.] *fuscus* *Latr.*

A form which I have not seen was described by LeConte, from New York, under the name *flavipes*; this was supposed by Jayne to be the same as the European *albidus* of Brullé, and may have been founded upon an introduced individual of that species, which in my opinion is distinct from *scrophulariæ*, although inscribed as a variety in the catalogues; *signatus* and *proteus* appear to be identical and to form a variety of *albidus*, but *senex* may be another distinct species. The two European species *muscorum* and *fuscus* are introduced above into the table, although I have never seen any examples taken in this country. Those mentioned by Jayne may have been adventitious importations. From the illustrations given of the antennæ, however, it is probable that Dr. Jayne did not have the true *muscorum* before him at all, but mistook the much smaller *castaneæ* for it; *muscorum* might therefore be stricken from the American lists. *Verbasci* and its varieties constitute the chief destructive element of entomological collections in temperate climates, but I have never known of any such habits in *scrophulariæ* or allied species.

TRINODINI.

This tribe includes at present but two very anomalous minute species, differing radically in sternal structure but perfectly homologous otherwise, and inhabiting the palaearctic and nearctic regions respectively. They represent two distinct genera as follows:—

Anterior coxæ narrowly separate; the process feebly carinate, free and received at tip within a deep anterior excavation in the broad mesosternum; tarsi shorter, the first joint of the posterior but little longer than the second. Europe

***Trinodes**

Anterior coxæ more widely separate; the intercoxal process flat, non-carinate and extending beneath the anterior margin of the still broader mesosternum, which is free, arcuate and feebly deflexed; prosternum more deflexed at apex, the tarsi longer with the basal joint more elongate. Eastern America **Apsectus**

In both these genera the hypomera are flat, becoming broadly, feebly impressed posteriorly, the antennæ long, with very slender shaft, received in repose within a narrow groove beneath the eyes, extending posteriorly for a short distance along the suture separating the prosternum from its hypomera, the club 3-jointed, with the two basal joints small, the third large and oblong-oval. The legs are slender and free, the posterior retractile, the hind coxal plate very short, but little longer internally and extending only to the wide parapleuræ, which are in a single piece.

Apsectus *Lec.*

The single species seems to be rare, though rather widely distributed; its general characters are as follows:—

Oval, convex, piceous-black, polished, sparsely clothed with long erect and bristling fulvo-piceous hairs, each of which completely fills at base a very minute punctule, which, consequently, only become distinctly visible on the removal of the bristles; prothorax transverse, closely fitted to the elytra and lobed as usual at base, the lateral edges entirely devoid of acute margin anteriorly but with an acute and narrowly reflexed margin in basal two-thirds, the surface with a fine deep groove in outer third, closely paralleling the basal margin; scutellum large, flat, equilatero-triangular; elytra wider than the prothorax and more than three times as long, evenly and conjointly rounded behind; under surface sparsely and very minutely punctulate, the pubescence shorter; legs and antennæ testaceous throughout, the large terminal joint of the latter blackish. Length 1.5 mm.; width 0.9 mm. Texas (Austin)..... **hispidus** *Melsk.*

The ocellus is unusually small and feeble in *Apsectus* but is much more distinct in *Trinodes*. I have seen specimens, either of *hispidus* or a species closely allied, collected by Mr. Schwarz in Arizona, but probably in the higher regions.

ORPHILINI.

This tribe is quite as anomalous as the Trinodini, and differs from any other in having the metacoxal plate well developed, almost equal in length throughout the width and extending to the sides of the body. The head rests in repose upon the vertical pointed plate forming the prosternum between the coxæ, and the body is glabrous. The legs and head are strongly retractile, the mesosternum transverse and even between the coxæ and the epipleuræ well defined. We have a single genus which is also palaearctic in range:—

Orphilus *Er.*

The body is compact, oblong-oval in form, moderately convex, the elytra impressed along the suture except at base and with rather prominent humeral callus, the prothorax at base as wide as the elytra, to which it is closely fitted, the base broadly lobed in the middle. The scutellum is well developed and ogival in form. The tarsi are slender, glabrous, much shorter than the tibiæ and the two basal joints of the posterior are subequal and each rather shorter than the third or fourth, which also are subequal, the fifth about as long as the first three together. The antennæ are 11-jointed, with a broadly oval compact club composed of three transverse free joints, and the eyes are emarginated by the short post-antennal sides of the front. The species are rather closely allied among themselves, and those represented in my cabinet may be distinguished as follows:—

- | | |
|---|------------------------------------|
| Integuments deep black, without metallic lustre..... | 2 |
| Integuments black, with bright steel-blue reflection..... | 4 |
| 2—Elytra finely and sparsely punctured throughout, the punctures toward base separated by at least twice their own diameters; pronotum finely and sparsely punctured throughout; integument highly polished. Length 3.2 mm.; width 1.8 mm. Arizona (Cañon of the Colorado River)—Dr. Prudden..... | |
| Elytra coarsely punctate toward base, where the punctures are separated by their own diameters or less..... | 3 |
| 3—Punctures of the elytra toward base smaller, always clearly separated, those of the pronotum fine but rather close-set. Length 2.8–3.5 mm.; width 1.6–2.1 mm. California to Colorado..... | subnitidus <i>Lee.</i> |
| Punctures of the basal regions coarser and usually densely crowded so as to become more or less distorted in form; pronotal punctures larger and stronger but relatively scarcely so close-set; body distinctly smaller in size. Length 2.3–2.8 mm.; width 1.28–1.7 mm. Lake Superior to Georgia..... | ater <i>Erichs.</i> |
| 4—Nearly similar in form to <i>ater</i> , the elytral punctures not so coarse or deep toward base and widely isolated among themselves, the pronotal punctures very fine and not close-set. Length 2.8–2.9 mm.; width 1.7 mm. Idaho (Cœur d'Alène)..... | chalybeus , <i>sp. nov.</i> |

Individuals of the various species appear to be abundant, and the genus, both in number of species and relative abundance, is much better represented in America than in Europe. *Niger* of Rossi, (= *glabratus* Fabr.), is the only European species, and its occurrence in this country has not been confirmed.

CLOIDÆ.

Maphoca, gen. nov.

The genus based upon the following characters may be placed for the present near *Plesiocis*. The body is narrow, parallel and moderately convex. Head well developed, wider than long, only moderately inclined, the eyes slightly behind the middle, remote from the base, moderate or rather small, entire, convex, relatively rather coarsely faceted, the facets individually strongly convex; front broadly and evenly arcuate from eye to eye, with a small transversely oval inclosed clypeus defined by a very feeble suture, the labrum small, rounded. Antennæ inserted under the sides of the front immediately before the eyes, short, 9-jointed, with a moderately developed loose parallel 2-jointed club, the two basal joints enlarged; three to six forming a slender shaft; third as long as the next two combined; four to six small, moniliform, the seventh transverse and wider. Maxillary palpi well developed, the last joint large, oval, slightly longer than wide, narrowly truncate at tip, the labial very minute; buccal opening small, the mentum very minute, longer than wide. Antennal grooves before the eyes rather distinct, the buccal processes almost obsolete; mandibles short and stout, bifid at tip. Prothorax widest toward apex, the disk even throughout and slightly convex; prosternum long before the coxæ, broadly truncate, the intercoxal process narrow. Elytra completely enclosing the abdomen, striato-punctate. Scutellum small, transversely oval or broadly angulate behind. Abdomen with five perfectly mobile segments, the sutures straight throughout, the first segment unmodified, as long as the next two combined; two to four decreasing scarcely visibly in length, the fifth scarcely longer than the fourth and rounded. Anterior coxæ small, very deep-set, transverse, the cavities narrowly open behind and angulate externally; intermediate and posterior narrowly separated, the latter extending nearly to the sides of the body, the met-episterna extremely narrow. Mesosternum even, transversely convex, the metasternum large. Legs

rather short, slender, the femora but slightly dilated, the tarsi much shorter than the tibiae, 4-jointed, the three basal joints small, the first with a brush of long hairs beneath, the fourth long and notably stout, the claws well developed, divaricate, slender, simple and arcuate. Epipleurae extending almost to the sutural angles but narrow throughout, scarcely at all dilated but horizontal toward base, inflexed behind the middle.

The extremely minute species having the assemblage of characters given above is one of those aberrant forms continually occurring among the serricorn *Clavicornia*. It may be described as follows:—

Body narrow and parallel, testaceous, the elytra blackish and the under surface piceous, the legs and antennae pale; surface rather shining; head nearly three-fourths as wide as the prothorax, the antennae as long as the width of the head; prothorax about a fourth wider than long, the sides rather prominently rounded at apical fourth, thence feebly convergent and straight or broadly, feebly sinuate nearly to the basal angles, which are somewhat obtuse; apex broadly arcuate, equal in width to the base, which is even and subtruncate; disk feebly convex, declivous at the sides, very minutely and feebly margined at base, minutely and rather sparsely punctate, each puncture with an extremely minute hair; elytra nearly twice as long as wide, scarcely visibly wider than the prothorax, rather obtusely rounded at tip, the sides parallel and almost straight, the humeral angles right and well defined; disk with even feebly impressed series of small punctures, the intervals each with a series of extremely minute punctures, each of which bears a very short, stiff erect hair. Length 1.05 mm.; width 0.35 mm. California (Mokelumne Hill, Calveras Co.)—Dr. F. E. Blaisdell..... **blaisdelli**, sp. nov.

No notes concerning the habits of this species have come to me, but probably they do not differ from those of other members of the family.

MELANDRYIDÆ.

TETRATOMINI.

The definition of this tribe must be enlarged to include all those Melandryids, with simple claws, which have the outer three or four antennal joints abruptly dilated to form a strongly developed loose and parallel club. The genera may be defined as follows:—

- Last four joints of the antennae dilated; eyes well developed, emarginate anteriorly; pronotal fovee distinct..... 2
 Last three joints abruptly and strongly dilated, forming a loose club; eyes emarginate or sinuate anteriorly, generally less developed; abdominal sutures moderately fine; edges of the prothorax subeven..... 4
 2—Pronotal margins not reflexed at the sides; basal segment of the abdomen about as long as the next two combined; joints of the antennal club pedunculate, the seventh not much dilated..... **Tetratoma**

- Pronotal margins rather broadly concave and reflexed, the edge unevenly undulato-crenulate3
- 3—Basal segment of the abdomen as long as the next two combined, the sutures very coarse,**Abstrulia**
- Basal segment but little longer than the second, one to five decreasing gradually in length, the sutures rather fine**Incolia**
- 4—Eyes rather well-developed; pronotum broadly reflexo-explanate at the sides, transversely truncate and scarcely perceptibly bisinuate at base, the foveæ obsolete; abdominal segments decreasing uniformly and slowly in length, the first scarcely visibly longer than the second.....**Eupisenus**
- Eyes smaller, very short and strongly transverse; prothorax not at all explanate at the sides, the base broadly, arcuately lobed at the middle, the foveæ distinct though not very well developed; first abdominal segment as long as the next two combined; body much shorter and more convex.....**Pisenus**

The last two of these genera were mutually confounded by LeConte and Horn, and both considered identical with the European tritomid genus *Triphyllus*. *Pisenus* resembles the latter considerably in form, and the noting of the 4-jointed hind tarsi, antennæ and pronotal foveæ no doubt led the distinguished authors astray; an inspection of the anterior and intermediate tarsi, which are 5-jointed, would have enabled them to avoid the error.

Tetratoma Fabr.

This holarctic genus contains several species in the European fauna, and the two following American species seem to be perfectly congeneric, as far as can be judged by the descriptions:—

Elongate-oval, strongly convex, rufo-testaceous, the head and antennæ black, the elytra steel-blue; body above polished, glabrous, except that each puncture encloses an infinitesimal hair; antennæ well developed, nearly two-fifths as long as the body, the club as long as the entire preceding portion, the joints quadrate or oblong, the last a little longer and pointed and all pedunculate at base; prothorax transverse, as wide at base as the base of the elytra, narrowed moderately from base to apex, the latter scarcely at all sinuate, with the angles broadly rounded, the base very broadly and feebly lobed at the middle and finely margined throughout like the sides, the latter broadly and very feebly irregular or subundulate; basal angles obtuse but not in the least blunt or rounded; punctures rather coarse and sparse, the basal foveæ distinct, deep and punctiform; scutellum moderately transverse, cordiform, finely punctured; elytra three-fifths longer than wide, a little more than three times as long as the prothorax, rather wider behind the middle than at base, thence rapidly, arcuately narrowed to the subogival apex; humeral callus obtusely prominent; punctures coarsely impressed and sparse; under surface more finely but rather sparsely punctate and sensibly pubescent; basal joint of the hind tarsi about as long as the last. Length 4.7–5.8 mm.; width 2.1–2.65 mm. Northern Atlantic regions.....**truncorum Lec.**

Elongate-oval, convex, finely and sparsely pubescent, shining, piceous with a reddish tinge; legs and base of the antennæ yellowish-brown; head more finely punctured; prothorax and elytra equally punctured, the former transverse, narrower in front, rounded at the sides which are narrowly margined, the base margined like the sides and with a large puncture half way between the middle and the basal angle, the latter obtuse and rounded. Length 4.0 mm. Colorado (Veta Pass).....**concolor** Lec.

The latter of these species I have not seen, but, from the originally published characters reproduced above, it would seem to be provisionally attachable to the true *Tetratoma*; the principal differences appear to reside in the pubescence and in the rounded basal angles of the prothorax.

Abstrulia, gen. nov.

The species of this genus differ greatly from *truncorum* in general habitus and in the structure of the sides and base of the prothorax. The irregularly crenulate sides of the latter are prominent just before the middle and at basal third or fourth, and the disk is concave along the basal margin, with the foveæ larger, deep and more impressed or less punctiform, the scutellum smaller and more nearly subquadrate, and the elytra are dark in color with a complex maculation of pale spots, the punctures coarse, impressed and sparse. The surface is sparsely but distinctly pubescent, and the basal joint of the hind tarsi is, as a rule, obviously shorter than the last. The species are mutually closely allied, and the three before me may be thus defined from the male :—

- Basal joint of the hind tarsi very much shorter than the last.....2
 Basal joint scarcely visibly shorter than the last.....3
 2—Oblong-oval, convex, polished, pale piceous-brown in color, the legs and antennæ concolorous, the elytra blackish with pale flavous and sharply defined intricate markings, the pale areas together somewhat exceeding the dark, and having as a prominent feature a subsutural obverted C-shaped mark on each extending near the suture to apical two-fifths; antennæ scarcely as long as the head and prothorax, the club distinctly shorter than the stem, cylindric, rather compact, the joints wider than long, the last a little longer than wide and conically pointed, the seventh joint transverse and forming a gradual passage to the club, third as long as the next two combined; prothorax short, nearly twice as wide as long, the base and apex equal in width, the latter transverse, narrowly and feebly sinuate at each side, the middle broadly arcuate and as advanced as the very broadly rounded angles, the base broadly, feebly lobed at the middle, the angles very obtuse but not rounded; punctures coarse and rather sparse, but not as coarse or sparse as those of the elytra, the pubescence distinct; elytra three and a half times as long as the prothorax and equal in width, two-thirds longer than wide, parabolic behind, parallel at the sides; basal angles obtuse, the cal-

- lus feeble; under surface finely and more closely punctured. Length 3.5 mm.; width 1.7 mm. New York.....**tessellata** *Melsh.*
- Oblong-oval, more convex, polished, black, the antennæ piceous toward base, the legs dark testaceous, the elytral pale markings rufo-testaceous and together not occupying as much area as the black ground, the subsutural pale spot not extending behind the middle and not forming an obverted C-shaped macula; antennæ nearly as in *tessellata* but black and stouter, the third joint very much shorter than the next two combined; prothorax much more convex, distinctly less than twice as wide as long, the sides broadly arcuate, converging anteriorly, the prominence before the middle almost obsolete; apex much narrower than the base and broadly sinuate; punctures moderately coarse and sparse; elytra nearly similar in form and sculpture, as wide as the prothorax but only three times as long; under surface finely, sparsely punctate. Length 3.0 mm.; width 1.45 mm. Pennsylvania.....**variegata**, sp. nov.
- 3—Body throughout nearly as in *tessellata* but black, the antennæ concolorous, the periphery of the pronotum rather paler, the legs piceo-testaceous, the elytral pale maculation nearly similar but less extended, much less in area than the black ground, the subsutural C-shaped marks before the middle much shorter and not extending distinctly behind the middle; antennæ nearly similar in structure but stouter, and with the third joint very much shorter than the next two combined; prothorax and elytra nearly similar in form, the former a little narrower at apex, with the apical angles somewhat more advanced and much less broadly rounded, the pubescence longer and more conspicuous; lateral prominence before the middle equally conspicuous and much more so than in *variegata*. Length 2.9 mm.; width 1.4 mm. Indiana.—Cab. Levette.....**maculata**, sp. nov.

In *tessellata* the male has a large and very abruptly limited deep oval excavation, slightly wider than long, occupying almost median third of the fifth ventral, and extending from the apex almost to the base, the bottom of the excavation polished, impunctate and glabrous, with a very few piliferous punctures posteriorly; in *maculata* it is equally deep and abrupt but smaller, occupying about median fourth and is more distinctly pubescent posteriorly; in *variegata* it is as large as in *tessellata* or larger, but very much more shallow.

Incolia, gen. nov.

In this genus the body is much more elongate and less convex than in either of the preceding, and differs greatly in abdominal structure and somewhat in its finer sculpture; in the form and structure of the antennæ and prothorax it is nearly similar to *Abstrulia*. The single species may be described as follows from the unique type, which appears to be a female:—

Body elongate, parallel, feebly convex, polished, blackish, the antennæ toward base, legs, limb of the pronotum and an indefinite oblique elytral streak, extending for

a short distance from the elytral humeri, dark testaceous; pubescence short, inclined, very sparse and rather inconspicuous; head rather small, not half as wide as the prothorax, the antennæ rather stout, nearly as long as the head and prothorax, the third joint as long as the next two combined, the seventh wider than the sixth, transverse, forming a broader support for the club, which is fully as long as the stem, cylindrical, the joints transverse and rather closely connected, the last oval and pointed; joints of the club much more than twice as thick as three to six; prothorax short, about twice as wide as long, the sides broadly arcuate and coarsely, feebly and irregularly crenulate throughout, more convergent anteriorly, the apex slightly narrower than the base and transversely, rectilinearly truncate; base feebly and arcuately lobed in rather more than median half, the lobe very large and impressed; side margins broadly reflexo-explanate, less widely so anteriorly, the basal angles very obtuse but not rounded, the apical obtusely rounded and not at all advanced; disk not concave along the base, but finely impressed within the basal bead, finely, sparsely punctate, the punctures gradually becoming closer and coarser toward the sides; scutellum slightly transverse, broadly angulate behind, minutely punctate; elytra much elongated, about twice as long as wide and four times as long as the prothorax, just visibly wider at three-fifths than at base and thence rapidly narrowed to the strongly rounded apex; humeral callus decidedly pronounced and elongate, gradually disappearing at some distance from the base; punctures impressed, rather sparse, moderately coarse, gradually becoming very fine posteriorly; sterna strongly, rather closely but not very coarsely, punctured, the abdomen minutely and rather densely so, especially toward the sides; tarsi slender, the first joint of the posterior as long as the last two combined. Length 3.8 mm.; width 1.6 mm. Indiana? **longipennis**, sp. nov.

The locality is reasonably certain, but the type bore no label in the cabinet of the late Dr. Levette. I considered this to be the *concolor* of LeConte, for some time, but the description will not serve, especially regarding the "narrowly margined" sides of the prothorax of *concolor*.

Eupisenus, gen. nov.

This is the only genus of the tribe Tetratomini which has been discovered thus far on the Pacific coast, the others all being inhabitants of the Atlantic districts. The body is elongate, parallel and moderately convex, with the prothorax relatively narrower than in the preceding genera, and the elytral humeri somewhat exposed at base. The following description of the only known species will bring out other characters which may prove to be generic:—

Parallel, polished, sparsely clothed with short fine and subdecumbent pubescence, black, the legs, antennæ, trophi and elytra pale luteous, the latter indefinitely shaded with piceous at the middle of the flanks and on the suture toward tip; antennæ rather stout, as long as the head and prothorax, the third joint about as

long as the next two together, eighth globular and perfectly similar to the seventh, the club very strong, parallel, the joints rather closely connected and strongly transverse, the last pointed and but little longer than wide; prothorax three-fourths wider than long, not more than two-thirds wider than the head, widest near basal third, the sides broadly arcuate, gradually converging anteriorly and almost even, the apex sensibly narrower than the base and broadly arcuate; basal angles slightly more than right and not at all rounded; surface rather coarsely and closely punctate; elytra parallel, obtusely and broadly rounded behind, four-fifths longer than wide, three and a half times as long as the prothorax and nearly a fourth wider, the punctures moderately fine but deeply impressed, somewhat close-set and nearly similar in size to those of the pronotum; humeri obtusely rectangular, the callus distinct; scutellum moderate, transverse; under surface polished, finely, rather sparsely punctured; legs slender, the four basal joints of the anterior and middle tarsi short, subequal and together but little longer than the last; basal joint of the posterior much shorter than the last. Length 4.5 mm.; width 1.65 mm. Alaska and southward..... **elongatus** Lec.

The head has a deep frontal impression at the middle of the line between the antennæ apparently in both sexes.

Pisenus, gen. nov.

The species of this genus may be readily distinguished from the preceding by the shorter, more oval form, greater convexity and much smaller size, as well as by the characters of the table; the prothorax, also, is as wide at base as the base of the elytra, so that the humeri are not exposed at base, and the sides of both form a virtually continuous arc. The antennæ are nearly similar in structure. The two species are the following:—

Body more elongate-oval, shining, clothed sparsely with rather short fine subdecumbent pubescence, black, the legs and antennæ dark testaceous, the basal regions of the elytra, especially at the humeri, suffusedly rufous; head about as wide as the rectilinearly truncate apex of the prothorax, the antennæ stout, fully as long as the head and prothorax, the eighth joint similar to the seventh and the club similar to that of *Eupisenus elongatus* but narrower; prothorax three-fourths or more wider than long, the sides almost perfectly even and broadly arcuate from the distinct basal angles to the apex, the latter much narrower than the base; surface rather finely but strongly, moderately closely punctate; scutellum transverse, broadly angulate behind; elytra suboval, rather ogivally pointed behind, scarcely at all wider than the prothorax and three times as long, two-thirds longer than wide, the punctures only moderately coarse, impressed, larger than those of the pronotum and somewhat sparse; under surface finely, rather sparsely punctate; legs moderately slender, rather short, the tarsi short, with the four basal joints of the anterior and intermediate equal among themselves and together about as long as the fifth, the last joint of the posterior very nearly as long as the first three combined. Length 2.8–3.1 mm.; width 1.3–1.4 mm. Pennsylvania, Indiana and northern Illinois; [*Triphyllus ruficornis* Lec.]..... **humeralis** Kirby

Body nearly similar to the preceding but shorter and more broadly oval, strongly convex, shining, rufo-testaceous throughout, the pubescence long, coarse, rather abundant and conspicuous, ashy in color; head smaller, notably narrower than the apex of the prothorax, the antennae similar to those of *humeralis* but still stouter, and with the third joint very much shorter than the next two combined; prothorax similar but only a little more than one-half wider than long and with the punctures coarse, deep and densely crowded; elytra sensibly wider than the prothorax and two and a half times as long, the sides slightly arcuate toward base, the apex gradually, rather narrowly rounded, one-half longer than wide, the punctures rather smaller than those of the pronotum and somewhat sparse, moderately coarse toward base, especially externally, gradually fine posteriorly; under surface finely, very densely punctate; legs rather stouter, the tarsi short but slender, the last joint of the posterior as long as the first three combined. Length 2.75 mm; width 1.4 mm. Virginia.....**pubescens**, sp. nov.

In no individual of the Tetratomini that I have seen, is there the faintest trace of serial arrangement of the always conspicuous elytral punctures at any part of the surface; the placing of *Tetratoma* near *Triplax*, by Redtenbacher, is an unaccountable error for this, as well as a multitude of other reasons, besides the radically different formation of the tarsi and palpi.

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NEW SPECIES OF FLORIDIAN NOCTUIDÆ.

BY JOHN B. SMITH, Sc.D.

The following species, with one exception, were taken by Mrs. Annie Trumbull Slosson to whose kindness I owe the types which will be deposited in the U. S. National Museum.

It is more than probable that all these are really West Indian or Central American types; but I have been unable to identify them with any described species.

This does not include all the new species taken by Mrs. Slosson; a few are to be described in a paper prepared for the Proceedings of the United States National Museum. There are here a number of new generic types, some of which are very peculiar.

***Erastria strigularia*, sp. nov.**

Ground color a light sepia brown, mottled, streaked and overlaid by white scales. Head and thorax without distinct maculation. Primaries with the lines confused, the whole wing streaked in appearance, the s. t. line contrastingly marked, as the only prominent feature in the wing. T. a. line single, brown, with long outer teeth, broken, incomplete. T. p. line single, brown, linear, outcurved over the cell, with a deep narrow sinus from the outcurve to the cell, itself, and another broader sinus, which extends inward to the t. a. line. S. t. line whitish, oblique, with a broad outward tooth at middle, preceded by a brown shade, the terminal space darkening a little to the fringes. A series of small, black venular dots, beyond which the fringes are cut with white. Fringes white-tipped at the anal angle. The ordinary spots are marked by a black line in the cell. Secondaries even, smoky brown; a broken black terminal line, fringes partly white-tipped. Beneath, primaries brown, the terminal space overlaid by white scales; secondaries whitish, with a brown central lunule and a broad outer band of brown scales, irregular, broken and diffuse.

Expands 27 mm. = 1.08 inches.

Habitat: Florida (Mrs. Slosson), 1 female only.

Unlike any of the described species and will be separated generically when more material is at hand. The specimen before me is de-

fective in the body parts: but the wings are in good condition. The apices of primaries are pointed and the middle of the outer margin is marked. Vein 5 of the secondaries is as strong as the others and is on a little spur from the junction of 3 and 4.

Fagitana obliqua, sp. nov.

Ground color velvety red-brown, the vestiture thick. Head and thorax without markings. Primaries without strong contrasts. Costal region a little paler, outer half of median space distinctly deeper red-brown, the median lines more yellowish. T. a. line outwardly margined with brown; starts from costa two-fifths from base inwardly oblique to inner margin at basal third. T. p. line margined by brown on both sides, evenly oblique, nearer to apex on costa than to the anal angle on inner margin. S. t. line brown, sinuate, hardly relieved. A series of brown interspaceal lunules just before the margin, which has a darker, followed by a pale line at the base of the concolorous fringes. Orbicular narrow, elongate, upright, faintly outlined by somewhat paler scales. Reniform lost in the darkening of the outer half of the median space. Secondaries evenly red-brown. Beneath red-brown, secondaries and terminal space of primaries somewhat paler.

Expands 27 mm. = 1.08 inches.

Habitat: Florida (Mrs. Slosson), one female.

One example only, in fair condition. The secondaries have v. 5 as strong as the others, and on a little spur from the median. The species differs at once from *littera* by the lack of all white markings in the primaries. This resembles very strongly the *Dianthocia tura* Druce, Biol. Cent. Am. Heter., p. 291, pl. 27, f. 19; but is different, I believe. At all events the new species is not a *Dianthocia* and, as it comes from a different faunal region, I will risk describing it.

Anticarsia ferruginea, sp. nov.

Ground color a bright, rusty-red brown, the vestiture a little rough. Head and body parts immaculate. Primaries with an upright, linear, white, contrasting reniform and a broad, richer brown, central median shade, which, continued across the secondaries, forms a more definite brown band. T. a. line purplish, single, broken, with three small, irregular outcurves in the interspaces. T. p. line blackish, linear, even, incurved on the costa, outcurved over the cell, then almost evenly oblique to the inner margin. S. t. line is a series of blackish, diffuse, interspaceal spots, bisinuate in general course. A series of diffuse, blackish, terminal, interspaceal marks. Reniform as described; orbicular, punctiform, whitish. Median band broad, diffuse, angulated on the median vein. Secondaries with the t. a. line continued half way across the wing. A moderately broad, well-defined median brown band across the middle, forms the continuation of the t. p. line and the median shade. The series of s. t. spots is continued across the wing. Beneath, more powdery and rusty, markings of upper surface reproduced in a general way, the ordinary spots of the primaries being blackish instead of white.

Expands 35 mm. = 1.40 inches.

Habitat: Florida, Mrs. Slosson.

The type and only specimen before me is a female in good condition, obviously different from the described species in our own fauna and, I believe, from other described forms as well.

Capnodes punctivena, sp. nov.

Ground color dull red-brown, a little irrorated with paler scales. Head and thorax concolorous. Abdomen with a little white line at each side along the margin of the second abdominal segment, else concolorous. Primaries without contrasts, the median lines marked by a series of white venular dots in a diffuse dusky line, which does not contrast to any great extent with the ground color. A white dot at base of median vein. T. a. line almost upright, a little outcurved. T. p. line outcurved over cell, incurved below, the median space being narrow as a whole and very narrow on the internal margin. S. t. line irregular, broken, composed of somewhat lunate pale marks which are preceded by irregular dusky shadings. Through the terminal space there is a series of yellow scales along the veins, a series of small, yellow, interspaceal terminal dots and blackish scales between them. The reniform is vaguely indicated by a dusky shade. Secondaries with the dusky portion of t. a. line traceable. T. p. line crosses the middle and is feebly bisinuate, the veins white dotted. S. t. line a series of dusky interspaceal spots followed by a paler shading. The terminal yellow dots are more elongate and toward the anal angle more resemble a broken line. Beneath, uniform fuscous brown, the secondaries with a linear, short, black, discal spot.

Expanse 27 mm. = 1.08 inches.

Habitat: Charlotte Harbor, Florida (Mrs. Slosson).

A single female, in good condition. It is possible that this cannot remain associated with *Capnodes* when the male is known. The middle tibiæ seem to have no spinules and the antennæ are ciliated and bristled:—rather an unusual female character. The maculation is very simple and not at all contrasting.

Kakopoda, gen. nov.

Habitus and form of an *Erebus* and referable to the *Erebiinae* in body and wing form, in the continuous lines crossing secondaries, and in the quadrid median vein of secondaries, on which the cell is short. Palpi long, oblique, second joint much the longest, terminal short and stout, exceeding head by half their own length. A small, pointed, frontal tuft. Antennæ of the male with long lateral bristles on each joint. Legs in male abnormal. The median tibia is stout, somewhat shorter than usual, terminated by a single spur only. The posterior tibia is decidedly shorter than normal, there is only a single terminal spur, while the median spurs are very close to the base and unusually long, unequal, one of them $\frac{1}{2}$ the other $\frac{3}{4}$ as long as the femur. There are no spines or other armatures. Primaries triangular, apices pointed, outer margin long, oblique, rounded, and even.

This genus is well marked by the peculiar malformation of the

middle and posterior tibiae, otherwise resembling *Selenis* in size and general appearance.

Kakopoda cincta, sp. nov.

Ground color red or umber brown shaded with bluish and black, the lines black. Vertex blackish. Upper side of antennae at basal third, smoky brown. Collar blackish brown at base. Thorax with an anterior, median and posterior blackish, transverse line. Abdomen smoky black at base, obscurely ringed to the apex, which is yellowish brown. Markings of primaries distinct. Basal line geminate, blackish, marked by a paler inclosed shade on the costa. T. a. line geminate, inwardly oblique, a little arcuate, inner line narrow, smoky, outer broad, blackish, a little diffuse, included space paler on the costa. Throughout the basal space is a bluish shading and a blackish transverse line. The t. p. line consists of a narrow, thread-like paler line, preceded by a prominent black line varying in width, shading inwardly into brown, followed by a steel-blue line which is outwardly diffuse, and shade into the subterminal space; varying in width. In course it is irregularly sinuate, as a whole about parallel with the outer margin. A narrow, obscure, blackish line runs parallel with, close to and within the t. p. line. Median shade line narrow, blackish, irregular. Reniform blackish, indefinite, moderate in size. S. t. line diffuse, yellowish brown, irregular, angulated below the apex and there emphasized by a preceding black shading. A black, festooned terminal line. Secondaries with the lines of primaries continued, but more crowded toward the center of the wing, leaving the basal and s. t. space clear; the latter yellowish brown, and forming a short band which joins and matches the last abdominal segment. Beneath yellowish, smoky, both wings crossed by three median, darker, somewhat crenulated lines, and by a looped or festooned terminal line.

Expands 28 mm. = 1.12 inches.

Habitat: Biscayne Bay, Florida (Mrs. Slosson).

A single male only, in good condition. The species should be readily recognizable, though the lines probably vary somewhat and the relative intensity of colors of the maculation may be considerably changed.

Egryrlon, gen. nov.

Head moderate in size, well applied to the thorax, but hardly retracted. Eyes hemispherical, hardly prominent, hairy. Front smooth, hardly convex, with a pointed frontal tuft. Antennae in the female simple, in the male (?). Palpi long, a little oblique, projecting half their length above the front. Middle joint a little the longest, stout, rather closely scaled; terminal joint more slender, a little flattened, almost equal throughout and obtuse at tip. Thorax about as broad as long, only a little convex, vestiture mixed hair and scales, rather close. Legs moderate in length, closely scaled, except that the middle tibia has a brush of loose vestiture at about the middle. Abdomen conic, closely scaled, scarcely exceeding the anal angles of the secondaries. Primaries trigonate, broad, outer and inner margin of nearly equal length, outer margin arcuate. Secondaries proportionate; discal cell short, vein 5 as strong as the others and referable to the median series.

This genus belongs to the Erebiid series, is nearest to *Trama* in general appearance, and is the first example known to me of the occurrence of hairy eyes in combination with other characters. Unfortunately I had no male.

Egrylron filaria, sp. nov.

Ground color dark chocolate brown. Head, thorax and abdomen without markings. Primaries with the median lines narrow, contrasting pale blue, the t. p. line followed by a bluish shading, which is broader toward the inner margin. The veins as they cross the t. a. line are a little blue powdered a short distance on each side. T. a. line a little outcurved, with a small angle on the subcostal vein, marked on each side by black scales. T. p. line outcurved over the cell, then rivulous to the inner margin. Edged on each side by black scales. S. t. line marked by a series of obscure black spots in the interspaces. There is a series of black, terminal lunules. Reniform small, narrow, upright, a little constricted, outlined by black scales. Secondaries with the t. p. line of primaries continued as a sinuate line about three-fifths from base, shaded outwardly by blue scales and inwardly edged by black scales. There is a linear, black, discal mark. Beneath a little paler brown, each wing with a black discal lunule.

Expands 23 mm. = .92 inch.

Habitat: Biscayne Bay, Florida (Mr. Slosson).

One female only, in good condition. The species should be easily recognizable by the clean cut blue lines on the chocolate ground; the outer is continued across the secondaries.

NOTES ON THE LARVAL-CASES OF LACOSOMIDÆ (PEROPHORIDÆ) AND LIFE-HISTORY OF LACOSOMA CHIRIDOTA GRT.

PLATE VI.

BY HARRISON G. DYAR.

No species of the family Lacosomidæ has had its life-history fully written. The best known larva is the North American *Cicinnus melsheimerii* Harris, of which the egg, half grown larva and mature larva have been described (see Packard, Ann. N. Y. Acad. Sci., VIII, 50). The youngest larvæ known seem to live already in a rude case. The same appears to be the condition in *Mimallo emilia* Stoll (see Sepp, Surin. Vlind., pl. 20). Both these species form at maturity a

well constructed case; but the height of perfection in this line is reached in *Cicinnus despecta* Walk. and allies, which construct a curious case as hard as wood. Of one of these, *C. externa*, Moore says: "This caterpillar lives in a hard hammock-like case formed of the excrement, joined together with silk and mucilage. The case is suspended from the twig on which it feeds by silk threads and is generally slung in a more or less vertical position, so that the curved end protects the upper opening from rain. Both ends of the case are alike and the caterpillar puts his head out at either end with equal facility." (Proc. Lit. Phil. Soc. Liverpool, XXXVI, 54.) Figure 9 of the plate shows a case like this.* Another group of larvæ form a case only at maturity, living at first under a net. Concerning one of these, *Cicinnus violacea*,† Sepp states that the larva when half grown lives in a reticular net, but later makes a case, using silk and pieces of leaves and bark mingled with excrements. (Surin. Vlind., pl. 30.) Such nets on the oak had been known to me for some time, but I did not at first suspect that they had any relation to the *Lacosomidæ*. They are quite common in the scrub oak country along the south shore of Long Island from Babylon to the eastern end, and they prove to belong to *Lacosoma chiridota*, a species usually very rare. Its life-history is as follows:

***Lacosoma chiridota* Grote.**

LARVA.

1890—Packard, 5th Rept. U. S. Ent. Comm., 141.

1893—Packard, Ann. N. Y. Acad. Sci. VIII, 47.

Egg.—Laid on the edge of the leaf or on one of the points. Cylindrical, the ends rounded and with a marked central constriction; base flat, a little spreading; a longitudinal groove along the lower part of each side; six longitudinal striæ, not marked enough to be ridges, the rest of the surface finely shagreened. Shell white; size $1.4 \times .4 \times .5$ mm. (Plate VI, fig. 1).

Stage I.—Under a net (Plate VI, fig. 3) on the upper side of a leaf of *Quercus tinctoria*. Head .3 mm. wide. Head and dorsum dark brown, darkest toward the sides; subventral region pale whitish

* See also the account in the Cambridge Nat. History Insects part ii, pp. 377-379 (as *Perophoridae*).

† Probably not belonging to this genus, but I have no specimens by which to correct the reference.

brown. Skin smooth, segments 3-annulate, setæ short and pale but distinct and with enlarged tips; i, ii and those of the cervical shield and head are especially short and paddle-shaped. Toward the end of the stage the larva enlarges the net, spinning cross threads nearly up to the anchors, strung with frass.

Stage II.—Head .5 mm. As before, the dorsal setæ with enlarged tips. Dorsal half of body brown with several fine, pale lines; subventral region whitish. Shape normal, the cervical shield large, not cornified; anal end tapering, not truncate; segments 3-annulate, annulet 1 large; feet short, dark brown.

Stage III.—Head .8 mm., pale brown, dotted and with two narrow pale yellowish lines that continue the addorsal lines of the body; a spot circled by pale on each side of the apex of the clypeus; setæ pale, the upper ones with bulbous tips. Body striped longitudinally with brown and pale yellowish; a geminate brown dorsal line; a broad subdorsal one, continuous with the brown sides of the head; subventral ridge prominent, pale; all with sparse pale granules. Joint 2 is as wide as the head, the posterior half of the body widened laterally; joint 13 small; subventral region brown, contracted. Setæ short, pale. Net 10 × 13 mm. in size (Plate VI, fig. 4). At the end of this stage larva cut a slit from the edge of the leaf to the eaten part under the net, being the first indication of a tendency to form a case. The larva also fastened the leaf firmly to the twig.

Stage IV.—Head 1.2 mm., pale yellow, thickly dotted with brown, leaving yellow lines on the sutures and in a vertical band on the face of each lobe. Body yellow, dotted with brown, forming four irregular and broken lines between the yellow dorsal line and substigmatal fold, a little heavier on the thorax and obscurely appearing to meet around the posterior end of the body. Anal plate large, yellow; cervical shield striped like the body. Tubercles small, dark, in pale areas; iv and v in line, somewhat approximate, with swollen apices. Segments annulate, granular from the primary tubercles. Subventral region dark brown, retracted and invisible from above.

Stage V.—Head 2.1 mm., greenish yellow with dark brown mottlings in vertical streaks, leaving irregular pale areas. Body yellow, lined longitudinally with brown; addorsal, subdorsal and lateral lines, the intervening yellow lines narrow and somewhat oblique, the brown dark only on the anterior third and posterior tip of the body, fainter luteous centrally; subventral ridge rather prominent, subventer dark

brown on the thorax, elsewhere faintly luteous. Venter pale, translucent. Feet pale, the abdominal ones very short with crotchets in an ellipse. Spiracles black. During this stage the larva left its net and constructed a rude case by uniting two leaves and partly biting them around. It spun a few threads across the opening.

Stage IV.—Head 2.7 mm. (in small male larva), round, higher than wide, the apex a little under joint 2; clypeus very small; surface wrinkled, shagreened; pale yellow, heavily mottled with brown spots which form streaks above the clypeus and leave a pale space above on the face of each lobe. Body dull greenish yellow in straight dorsal and in slightly oblique and dislocated subdorsal, lateral and suprastigmatal lines, the subventral line straight and running along the prominent subventral fold. Spaces between these lines filled in with dark brown at the extremities only; *i. e.*, in three bands on thorax and subventrally and in irregular spots on joint 13. Spiracles black rimmed. Cervical shield large, with two brown bands on each half. The posterior part of joints 12 and 13, which is dark spotted, becomes transversely folded and assumes, imperfectly, the appearance of a round area, a little flattened, about the size of the hole in the case. The case is made of two leaves or of a single leaf bent over and cut off, the holes at the end made circular by thread. At the end of the stage the larva spins up one end of the case and hibernates. Pupation in the spring. A single brood in the year.

Food-plants, all the oaks, *Q. alba*, *Q. minor*, *Q. coccinea*, *Q. tinctoria*, *Q. nana*.

EXPLANATION OF PLATE VI.

- Fig. 1. Egg shell, side view, enlarged.
- Fig. 2. The same, end view.
- Fig. 3. Larval net, stage I, enlarged.
- Fig. 4. Larval net, stage III.
- Fig. 5. Case of mature larva.
- Fig. 6. Larva, dorsal view.
- Fig. 7. Head of larva, enlarged.
- Fig. 8. Moth of *Lacosoma chiridota*.
- Fig. 9. Larval case of *Cicinnus despecta* Walk.

OVIPOSITING OF VANESSA ANTIOPA.

ARCHIBALD C. WEEKS.

At Richmond Valley, Staten Island, on April 15th, of this year, I was fortunate enough to discover an *Antiopa* in the act of ovipositing. As the process is one rarely seen its record may be interesting. The locality was warm, sunny and completely sheltered from the wind. In passing through a thicket of pussy willows (*Salix candida* (?)), I almost ran against the butterfly resting motionless, head downward, close to the extremity of a slender willow stem, the catkins of which were not yet in bloom. The wings were extended at right angles with the body, the under side facing the sun, but the primaries were pushed backward so as to cover the secondaries, and in this position the insect perched at the end of the stalk afforded an almost exact counterpart of a blackened and withered bowl-shaped calyx with an irregular and faded out upper edge. Aside from the short catkins, every stem, branch and twig in the vicinity was entirely denuded, the only objects suggestive of leaf or flower being some dried and withered seed pods of the swamp *Asclepias* which still clung to the extremities of the dead stalks. The butterfly, as if realizing how conspicuous its situation was, remained as motionless and fixed as possible, without the flutter of a wing, as if forming an integral part of the stalk, only the closest observation availing to detect the movement of the abdomen and the scarcely perceptible advance down the stem—a fine example of protective mimicry. The first eggs were deposited only an inch from the end of the stalk, close to the stem, and encircling it just as far as the insect could reach without altering its position. When discovered the eggs had been half deposited, but the insect continued its work entirely oblivious of my proximity and without the slightest change of attitude. The eggs were not laid in regular rows, but in an arrangement somewhat resembling the alternate squares upon a checkerboard having the corners in contact but the sides free. The egg cluster extended irregularly along the stem some two inches, was of a pale yellow color, and contained as nearly as could be computed about four hundred and fifty eggs, probably the entire contents of the ovary; the lowest, of course, being deposited last. The egg under a lens suggested a musk melon with the surface divided into eight longitudinal sections by as many cream-colored

ribs, each terminating at a small circle at the apex, in the center of which the germ could be distinctly seen. The instinct of the butterfly in selecting the dwarf willows, which develop earliest, as a depository for its eggs in spring, while preferring the tree willows for the August brood is a matter of common experience. Last summer a large brood of the larvæ of this insect fed on the hop vines in the rear of my Brooklyn residence. A comparison of the number of eggs laid in the present instance with the ordinary number of larvæ generally constituting a brood after the second or third adult (50-100) may be used as an indication of the great percentage which never attain maturity. The stalk with its egg cluster were preserved in order to note further developments.

NEW NORTH AMERICAN TIPULIDÆ.

BY R. W. DOANE.

Dicranomyia ochracea, sp. nov. (Pl. VII, fig. 1.)

Ochraceous; front brownish; rostrum light yellow; palpi yellow, infuscated toward tip; antennæ light brown; joints of flagellum with a short sparse pubescence; verticels of moderate length; thorax pale ochraceous, dorsum with a broad brown stripe which is divided back of the suture; scutellum and metanotum with a brownish tinge; halteres pale; knobs brownish, abdomen brownish above, lighter underneath; forceps of male lighter brown; legs tawny, tarsi infuscated at tip; wings hyaline, stigma with a faint brownish tinge; tip of auxiliary vein opposite the origin of the prefurca; distance of the subcostal cross vein from the tip of the auxiliary vein about equal to the length of the prefurca; no marginal cross vein apparent; discal cell open, coalescing with the second posterior cell; veins brownish with a short pubescence in the apical portion of the wings. Length, male 4.5 mm.; wing 6 mm.

Habitat: Moscow Mountain, Idaho, one male. (Doane.) Type no. 103. Wash. Agric. Coll. & S. of S.

Dicranomyia cinerea, sp. nov. (Pl. VII, fig. 2.)

Cinereous; head cinereous; front with a rather broad brown longitudinal stripe; rostrum reddish brown; palpi brown; antennæ yellowish, somewhat infuscated; thorax cinereous, dorsum with three brown stripes, the median one divided by a narrow cinereous line; pleuræ with two distinct narrow brown lines, the space between the lines being almost white; metanotum slightly infuscated in the middle; halteres pale, knobs somewhat infuscated; abdomen brownish, lateral margins somewhat darker; ovipositor yellow; legs light tawny; tip of femora with a rather broad brown band; the base and tip of tibia likewise with a brown band which is some-

what darker than that of the femora; tarsi brownish almost blackish toward the tip; wings hyaline, stigma with a faint brownish tinge; tip of the auxiliary vein some distance before the origin of the præfurca, the distance being a little more than the length of the præfurca; distance of the subcostal vein from the tip of the auxiliary vein is greater than the length of the præfurca; no marginal cross vein perceptible; discal cell open, coalescing with the third posterior cell; first posterior cell distinctly narrowed at its outer end; veins brownish, those at the base of the submarginal, the first and the fourth posterior cells being much darker. Length, female 4.5 mm.; wing 5 mm.

Habitat: Pullman, Wash., one female. (Piper.) Type no. 104. Wash. Agric. Coll. & S. of S.

Dicranomyia citrina, sp. nov. (Pl. VII, fig. 3.)

Reddish yellow; head and antennæ somewhat lighter; antennæ infuscated toward tip; rostrum prolonged, two-thirds as long as head; thorax wholly reddish yellow; halteres pale, knob infuscated; legs light tawny yellow; tarsi slightly darker at tip; abdomen light tawny yellow; tip of ovipositor more reddish yellow; male genitalia large; wings hyaline, stigma pale; tip of auxiliary vein opposite the origin of the præfurca; subcostal cross vein only a short distance from the tip of the auxiliary vein; marginal cross vein at the tip of the first longitudinal vein; veins yellowish; discal cell closed. Length, female 7 mm.; wing 7 mm.

Habitat: Wawawai, Wash., one female. (Doane.) Type no. 105. Wash. Agric. Coll. & S. of S.

Resembles *D. pudica* O. S. but larger; wings broader, veins more yellowish and tip of auxiliary vein opposite instead of slightly anterior to the origin of the præfurca.

Dicranomyia helva, sp. nov. (Pl. VII, fig. 4.)

Yellow; head yellow; brownish above; rostrum yellow; antennæ brown; first segment of palpi yellow, others brown; thorax yellow with a brownish tinge, the single median brown stripe but faintly indicated back of the suture; pleuræ somewhat lighter yellow; halteres rather long, infuscated, lighter toward base; legs yellow, last segment of tarsi infuscated; abdomen brownish yellow; ovipositor lighter yellow; wings hyaline, stigma pale; tip of auxiliary vein opposite origin of præfurca; distance of the subcostal cross vein from the tip of the auxiliary vein equal to a little more than the length of the stigma; veins yellowish; discal cell closed. Length, female 6 mm.; wing 6.5 mm.

Habitat: Colorado, one female. (Morrison.) Type no. 106. Wash. Agric. Coll. & S. of S.

Dicranomyia isabellina, sp. nov. (Pl. VII, fig. 5.)

Ochraceous; head yellowish brown; rostrum yellowish; palpi and antennæ yellowish, the latter somewhat infuscated; thorax ochraceous; halteres pale, knob infuscated; abdomen brownish yellow, edge darker brown; ovipositor yellowish;

legs wholly tawny, with a very short dense black pubescence; wings hyaline, stigma with a very slight brownish tinge; the tip of the auxiliary vein anterior to the origin of the præfurca by about half the length of the stigma; the distance of the subcostal cross vein from the tip of the auxiliary vein about equal to the length of the præfurca; discal cell closed; veins brownish with a very short pubescence in the apical portion of the wings. Length, female 4 mm.; wings 5.5 mm.

Habitat: Pennsylvania, one female. (Dietz.) Type no. 107. Wash. Agric. Coll. & S. of S.

Dicranomyia brunnea, sp. nov. (Pl. VII, fig. 6.)

Brown; head grayish, brownish above; palpi and antennæ brown; dorsum of thorax reddish brown with a very narrow median lighter line; pleuræ with a grayish reflection; halteres pale, knob infuscated; legs tawny, tarsi and tips of femora and tibia darker; abdomen light brown, darker above; ovipositor reddish brown; wings with a slight brownish tinge; veins reddish brown; tip of the auxiliary vein very little beyond the origin of the præfurca; the distance of the subcostal cross vein from the tip of the auxiliary vein a little more than the length of the stigma; discal cell closed. Length, female 8 mm.; wing 8 mm.

Habitat: Nantucket, one female. (Scudder.) Type no. 108. Wash. Agric. Coll. & S. of S.

Dicranomyia gracilis, sp. nov. (Pl. VII, fig. 7.)

Pale yellow; head darker yellow, brownish above; palpi and antennæ brown; thorax pale yellow, the single median narrow stripe on the dorsum not extending back on the suture; halteres rather long, yellowish at base, infuscated toward tip, knob brownish; abdomen yellowish brown; legs tawny, tarsi slightly darker; wings hyaline, stigma pale; tip of the auxiliary vein opposite the origin of the præfurca; the subcostal cross vein some distance before the tip of the auxiliary vein; veins yellowish or brownish with a short pubescence in the apical portion of the wings; discal cell closed. Length, female 7 mm.; male 6 mm.; wing 7.5 mm.

Habitat: Moscow Mountain, Idaho, one male, one female. (Doane.) Type no. 109. Wash. Agric. Coll. & S. of S.

Dicranomyia moniliformis, sp. nov. (Pl. VII, fig. 8.)

Brown; head brown; rostrum yellowish; antennæ reddish brown, joints moniliform; palpi blackish, basal segment yellowish; thorax light brown, the single rather broad dorsal stripe almost obsolete; scutellum yellowish; metanotum dark brown; halteres pale, knobs yellowish; legs tawny, tarsi and the tips of femora and tibia darker; abdomen brownish yellow; wings with a brownish tinge; tip of the auxiliary vein a very short distance before the origin of the præfurca; subcostal cross vein near the tip of the auxiliary vein; veins brownish with a very short pubescence in the apical portion of the wings. Length, male 7 mm.; female 7.5 mm.; wings 8.5 mm.

Habitat: Colorado, one male. (Morrison.) Type. L. 1., one female. Nantucket, one female. (Scudder.) Type no. 110. Wash. Agric. Coll. & S. of S.

Dicranomyia fulva, sp. nov. (Pl. VII, fig. 9.)

Yellowish; head grayish brown; rostrum grayish yellow; palpi black, yellowish at base; antennæ yellowish, infuscated dorsally and toward the tip; joints of flagellum moniliform; dorsum of thorax dark brown; pleuræ and metanotum reddish yellow, latter slightly infuscated; halteres pale; abdomen brownish; ovipositor light yellow; legs tawny, beset with a short dense black pubescence which makes them appear much darker; tarsi much darker; wings hyaline, stigma pale; tip of the auxiliary vein a very short distance beyond the origin of the præfurca; subcostal cross vein opposite the origin of the præfurca; the marginal cross vein at the tip of the first longitudinal vein; veins brownish; discal cell closed; posterior cross vein near the end of the discal cell. Length, male 7 mm.; female 9 mm.; wing 8.5 mm.

Habitat: Pullman, Wash., one male, six females. (Doane.)
Type no. 111. Wash. Agric. Coll. & S. of S.

Dicranomyia stigmata, sp. nov. (Pl. VII, fig. 10.)

Brown; head darker brown; palpi dark brown; rostrum and antennæ light brown; joints of flagellum moniliform; thorax brown; pleuræ and metanotum with a hoary reflection; halteres pale, knobs brownish; abdomen brownish above, lighter underneath; forceps of male lighter; legs tawny; tips of tarsi darker; wings hyaline, stigma brownish; tip of the auxiliary vein a short distance beyond the origin of the præfurca; subcostal cross vein nearly opposite the origin of the præfurca; distal cell closed; posterior cross vein before the inner end of the distal cell; veins brownish with a short pubescence in the apical portion of the wings. Length, male 6 mm.; wing 7.5 mm.

Habitat: Palo Alto, Cal., one male. (Doane.) Type no. 112.
Wash. Agric. Coll. & S. of S.

Dicranomyia infuscata, sp. nov. (Pl. VII, fig. 11.)

Brown; head darker; rostrum, palpi and antennæ dark brown; antennæ if bent back could reach a little beyond the base of the wing; thorax light brown; dorsum and a broad line on the pleura and the metanotum dark brown; halteres rather long, infuscated, yellowish at base, knobs brown; abdomen brownish above, lighter below; posterior margins of the segments darker; forceps of male very large, dark; legs brown; tips of femora and base of tibia whitish; wings hyaline, with a brownish tinge; stigma brown; tip of auxiliary vein a short distance beyond the origin of the præfurca; subcostal cross vein at the tip of the auxiliary vein; a very faint hardly perceptible brownish cloud along the cross veins; discal cell closed; veins brown, a very short pubescence in the apical portion of wings. Length, male 6 mm.; wing 5 mm.

Habitat: Collins, Ida., two males. (Piper.) Type no. 113.
Wash. Agric. Coll. & S. of S.

Dicranomyia duplicata, sp. nov. (Pl. VII, fig. 12.)

Brown; head darker; rostrum, palpi and antennæ brown, latter submoniliform; pedicels short and very slender; thorax grayish brown; stripes darker brown, indistinct; halteres pale, knobs slightly infuscated; legs tawny; tarsi, tips of femora and

tibia darker; abdomen brown; posterior margin of segments darker; wings grayish with brown spots and clouds; the four brown clouds along the anterior margin are the most conspicuous and are placed as follows: The first opposite the inner end of the basal cells; the second over the subcostal cross vein and opposite the tip of the anal vein which is also surrounded by a fainter brown cloud; the third over the tip of the auxiliary vein and the origin of the præfurca; the fourth over the marginal cross vein and the tip of the first vein; a brown cloud at the base of the submarginal cell and over all the cross veins; all the cells with small dots arranged in more or less irregular rows; tip of auxiliary vein a short distance beyond the origin of the præfurca; a second subcostal cross vein close to its tip; posterior cross vein just before the inner end of the discal cell which is closed. Length, female 7 mm.; wing 9 mm.

Habitat: Tokeland, Wash., one female. (Doane.) Type no. 114. Wash. Agric. Coll. & S. of S.

***Geranomyia distincta*, sp. nov.** (Pl. VII, fig. 13.)

Yellow; head grayish above, proboscis yellowish, brownish toward base, about four times the length of the head; antennæ yellowish brown; thorax wholly reddish yellow; halteres pale; legs pale yellow; tarsi and tip of tibia darker; abdomen brown; forcep yellow; wings slightly tinged with yellow; stigma pale; tip of auxiliary vein opposite the middle of the præfurca; subcostal cross vein at the tip of the auxiliary vein; first longitudinal vein incurved toward the second; discal cell in the single specimen before me, open coalescing with the second posterior cell; veins yellowish. Length, male 6.5 mm.; wing 8 mm.

Habitat: New Bedford, Conn., one male. (Hough.) Type no. 115. Wash. Agric. Coll. & S. of S.

***Trochobola elegans*, sp. nov.** (Pl. VII, fig. 14.)

Brownish yellow; head dark brown almost black; front and vertex silvery white; palpi dark brown; first two joints of antennæ dark brown, others much lighter brown; dorsum of thorax brownish yellow with three brown stripes, the lateral ones extending anteriorly over the prothorax, the median one sometimes divided back of the suture; pleura with a silvery reflection, with two brown stripes; metanotum brown; halteres dark brown; tips of knobs lighter brown, bases white; legs yellowish; femora with a brown band before the apex; abdomen yellowish with a brown band on the posterior margin of each segment; ovipositor short, reddish; wings with a whitish tinge, marked with many brown clouds and spots, those along margins being largest; the most important of these are as follows: one in the region of the humeral cross vein; one over the origin of the præfurca; one at the tip of the auxiliary vein; one just before and including the tip of the first vein; one at the tip of the second vein; and one in the margins of the fourth posterior, anal, axillary, and spurious cells; other smaller spots are scattered over the surface of the wing, the second basal cell containing more than any of the other cells; all the cross veins are broadly margined with brown and the tips of all the longitudinal veins are marked with larger or smaller spots. Length, male 9 mm.; female 10 mm.; wing 11 mm.

Habitat: Tokeland, Wash., one female (type). Collins, Ida., one male. (Doane.) Type no. 116. Wash. Agric. Coll. & S. of S.

Dicranoptycha borealis, sp. nov. (Pl. VII, fig. 15.)

Brownish yellow; head yellowish brown; palpi and the first two segments of antennæ brown, remaining segments of antennæ pale yellow, darker at the base; thorax yellow, dorsum with three rather broad brown stripes; pleura with a hoary reflection; metanotum with a brownish tinge; halteres pale yellow; lighter toward the base; legs yellow; femora with a brown ring at the tip and another a short distance before the tip; last segment of the tarsi brown; abdomen yellowish brown; wings rather broad with a yellowish or brownish tinge; small rather faint brownish spots at the origin of the præfurca, at the tip of the auxiliary vein, at the tip of the first longitudinal vein, and over all the cross veins; veins yellowish, those in the apical portion faintly margined with brown. Length, male 9 mm.; wing 11 mm.

Habitat: Unalaska, one male. (Kincaid.) Type no. 117. Wash. Agric. Coll. & S. of S.

Rhypholophus fusiformis, sp. nov. (Pl. VII, fig. 16.)

Light brown; head grayish brown; palpi brown; first two joints of antennæ yellowish, others light brown, fusiform, with a rather long fine dense whitish pubescence; thorax uniformly brown; halteres pale yellow, almost white; abdomen brown with a long rather dense golden yellow pubescence; wings rather broad with a brownish tinge, discal cell closed; sixth and seventh veins widely divergent toward the tip; a very faint brownish tinge in the region of the stigma; præfurca very long, arising at a sharp angle with the first vein some distance before the middle of the wing; posterior cross vein at the base of the discal cell; inner end of the discal cell very narrow; hairs on the wing rather short and sparse. Length, male 3.5 mm.; wing 5 mm.

Habitat: Collins, Ida., one male. (Piper.) Type no. 118. Wash. Agric. Coll. & S. of S.

Rhypholophus manicatus, sp. nov. (Pl. VII, fig. 17.)

Brown; head and its appendages brown; antennæ with rather long verticils, first two segments paler than the rest; thorax brown; pleura, and sometimes the metanotum, with a hoary reflection; halteres brown, whitish toward base; legs brown; femora somewhat lighter toward base; abdomen brown with a golden yellow pile; wings with a brownish tinge somewhat darker in the region of the stigma; discal cell open, coalescing with the third posterior cell; veins brown, sixth and seventh widely divergent toward the tip; præfurca arising before the middle of the wing; posterior cross vein at the base of the discal cell; hair on the wings rather long and dense. Length, male 4.5 mm.; female 4.5 mm.; wing 5 mm.

Habitat: Collins, Ida., three males, one female. (Piper.) Type no. 119. Wash. Agric. Coll. & S. of S.

Rhypholophus lanuginosus, sp. nov. (Pl. VII, fig. 18.)

Dark brown; head somewhat lighter brown; palpi brown; first two segments of the antennæ yellowish, others brown; in the male much elongated, fusiform, with a short whitish pubescence and distinct verticels; if bent back they would reach nearly to the base of the abdomen; the antennæ of the female are much shorter, hardly reaching the base of the wings; thorax wholly dark brown; halteres pale, slightly infuscated at tip; legs brown; coxae and base of femora lighter; abdomen blackish, with a golden yellow pubescence; wings rather broad, with a brownish tinge; stigma brown; discal cell open; veins brown; seventh vein somewhat arcuated, so that the distal half of the anal cell is of almost the same width throughout; posterior cross vein at the base of the discal cell; pubescence on the wings rather long and dense. Length, male 6 mm.; female 8 mm.; wings 7.5 mm.

Habitat: Collins, Ida., seven males, one female. (Piper.) Type no. 120. Wash. Agric. Coll. & S. of S.

Rhypholophus fumatus, sp. nov. (Pl. VII, fig. 19.)

Brown; head and palpi darker brown; first two segments of antennæ yellowish, others brown, subcylindrical, comparatively short; thorax uniformly grayish brown, halteres light, knobs infuscated; legs yellowish; tarsi, and sometimes the tibia brownish; abdomen very dark brown with a short yellow pubescence; male genitalia lighter brown; wings with a brownish tinge; stigma dark brown; discal cell closed; veins brown, seventh arcuated in such a manner that the anal cell is broader in the middle than at the tip; posterior cross vein at the inner end of the discal cell. Length, male 5 mm.; wing 7 mm.

Habitat: Collins, Ida., three males. (Doane, Piper.) Type no. 121. Wash. Agric. Coll. & S. of S.

Erioptera comata, sp. nov. (Pl. VII, fig. 20.)

Brown; head brown, front grayish brown with a few short golden yellow hairs; rostrum and palpi dark brown almost black; antennæ brown, segments rather short, cylindrical; dorsum of thorax wholly brown; pleura with a faint silvery reflection; halteres pale; legs yellowish; the tarsi and the tips of the femora and tibia darker; abdomen brown with a sparse golden-yellow pubescence; male genitalia lighter; ovipositor ferruginous; wings hyaline; the brown pubescence along the veins giving them a brownish tinge; the præfurca ends in the first submarginal cell which is a little longer than the second; discal cell open; veins brownish, those at the base of the first submarginal and the discal cells as well as the posterior cross vein narrowly bordered with brown, thus making two small faint brown spots on the wings. Length, female 5 mm.; wing 6 mm.

Habitat: Pullman, Wash., two females (type). (Doane.) Seattle, Wash., one male. (Piper.) Type no. 122. Wash. Agric. Coll. & S. of S.

Chionea nivicola, sp. nov.

Reddish brown; head cinereous; eyes round, shining, black; rostrum nearly half as long as head; the four-jointed palpi somewhat reddish; antennæ a little longer

than the head, first three joints reddish brown, last five much lighter; first segment cylindrical, second segment cylindrical for the most part but the distal one-fourth much enlarged into a roundish knob; third about as long as the knob of the second, joining widely with the knob of the second but growing rapidly smaller distally; fourth equal in length to the third, fusiform; fifth a little longer than the fourth, cylindrical; sixth, seventh and eighth subequal with the fifth; all segments with a few rather long stiff hairs (the above description of the antennæ was drawn from a mounted specimen, examined with a simple lens it is almost impossible to determine the number of the segments); thorax brownish; halteres yellow, knob quite large, elongated; coxæ very large, same color as the thorax, excavated above toward the tip; femora reddish brown towards the base, darker toward the tip, long, appears flattened when seen from above but quite concave posteriorly; tibia reddish brown, somewhat flattened, only slightly concave posteriorly; tarsi darker; claws rather long, smooth; abdomen with six segments; pleura dirty brownish white, remainder reddish brown with a slightly darker median dorsal interrupted line; basal portion of ovipositor colored as the rest of the body, distal one-half reddish yellow, in some lights quite red, lower valves straight, sharp-pointed, upper valves slightly curved, longer, with more red; the upper and lower valves separated toward the base. Length, female 4 mm.

Habitat: Pullman, Wash., four females. (Doane.) Type no. 123. Wash. Agric. Coll. & S. of S.

Gonomyia virgata, sp. nov. (Pl. VII, fig. 21.)

Pale yellow; head yellow; palpi and antennæ brown, the latter when bent back would reach to the base of the wings; thorax pale yellow; dorsum almost completely covered by the broad brownish stripes; a brown stripe running from the collar to the base of the halteres and a narrow brown spot between the first and second pair of coxæ; metanotum brown; halteres pale, very slightly infuscated at the tip; legs tawny; tips of femora, tibia and tarsi somewhat darker; abdomen brown; ovipositor ferrugineous; wings hyaline; stigma pale; tip of the auxiliary vein a short distance beyond the origin of the prefurca; subcostal cross vein close to its tip; no marginal cross vein; first submarginal cell a little more than half of the length of the second; inner end of the latter in one line with the first posterior and discal cells; four posterior cells; discal cell closed; posterior cross vein at its inner end; veins with a short pubescence in the apical portion of the wing. Length, male 5 mm., female 6 mm.; wing 6.5 mm.

Habitat: Tokeland, Wash., two males; four females. (Doane.) Type no. 146. Wash. Agric. Coll. & S. of S.

Cryptolabis bisinuatis, sp. nov. (Pl. VII, fig. 22.)

Brown; head darker brown; front rostrum and palpi blackish; antennæ brown, darker toward the tip; thorax wholly grayish brown; halteres pale; legs tawny; tarsi and the tips of the femora and the tibia darker brown; abdomen dark brown, very short; male genitalia paler; wings hyaline; veins brown; prefurca distinctly bisinuate; the very straight short sparse pubescence along the veins and in the cells

in the apical portions of the wings can hardly be detected with the simple lens. Length, male 3 mm.; wing 5 mm.

Habitat: Spokane, Wash., two males. (Doane.) Type no. 124. Wash. Agric. Coll. & S. of S.

***Limnophila flavapila*, sp. nov.** (Pl. VIII, fig. 1.)

Yellowish; head brown; front and occiput with a short golden-yellow pile; rostrum, palpi and basal segment of antennae darker brown, rest of antennae yellowish brown; thorax brownish yellow; pleura and metanotum with a silvery reflection; halteres yellowish, distal half of knob brown; legs yellow; tarsi and the tips of the femora and tibia brown; abdomen brownish yellow, ovipositor ferruginous; wings with a yellowish tinge; stigma brown; veins in the costal region yellowish, others brown, seventh somewhat bisinuate; the subcostal cross vein at the end of the auxiliary vein which apparently ends in the first longitudinal vein; marginal cross vein at the tip of the first longitudinal vein. Length, male 14 mm.; female 14 mm.; wing 13 mm.

Habitat: Pullman, Wash., one male; three females. (Doane.) Type no. 125. Wash. Agric. Coll. & S. of S.

***Limnophila nigrilinea*, sp. nov.** (Pl. VIII, fig. 2.)

Light yellow, with a continuous black band from the front of the head to the tip of the abdomen; head yellow, the black band partially interrupted in the middle; palpi brown; antennae light yellow; thorax pale yellow, the black band covering nearly all of the dorsum; legs tawny; femora, except the tip, more yellowish; abdomen yellowish below and on the sides, blackish above; wings hyaline with a very faint yellowish tinge along the anterior margin; a sparse short but distinct pubescence in all the cells in the apical portion of the wing; stigma pale; veins brown; tip of the auxiliary vein opposite the inner end of the second submarginal cell which is a little longer than the first posterior cell; marginal cross vein a short distance from the end of the first longitudinal vein and close to the inner end of the first submarginal cell; petiole of the latter longer than the posterior cross vein; four posterior cells; posterior cross vein before the middle of discal cell. Length, female 12 mm.; wing 14 mm.

Habitat: Olympia, Wash., one female. (Kincaid.) Type no. 126. Wash. Agric. Coll. & S. of S.

***Limnophila superlineata*, sp. nov.** (Pl. VIII, fig. 3.)

Brown; head grayish brown, vertex darker; palpi and first two segments of antennae rather dark brown; other segments of antennae lighter brown or yellowish; thorax gray; besides the usual three brown stripes, the median one of which is divided in front of the suture, there is on each side another narrow brown line; these run forward from the base of the wing and meet just above the collar; halteres light brown; knobs infuscated; legs yellowish brown; tips of the femora and the tibia darker; abdomen brown; ovipositor more reddish brown, rather long; wings with a grayish tinge, with brown spots or clouds in all the cells on all the cross veins and at

the tips of all the longitudinal veins; the largest of these are along the anterior margin, one covering the origin of the præfurca and others at the tips of the auxiliary and the first and second longitudinal veins; veins brownish; auxiliary vein ending far beyond the origin of the præfurca, subcostal cross vein a short distance from its tip; petiole of first submarginal cell about as long as the posterior cross vein; five posterior cells; the second basal cell with a supernumerary cross vein. Length, male 7 mm.; female 8 mm.; wing 8.5 mm.

Habitat: Wawawai, Wash., one male, three females. (Doane.)
Type no. 127. Wash. Agric. Coll. & S. of S.

***Limnophila lutea*, sp. nov.** (Pl. VIII, fig. 4.)

Yellow; head darker yellow, vertex brownish; palpi dark brown; antennæ brownish yellow; thorax wholly ochraceous; halteres light, knobs slightly infuscated; legs tawny; coxæ and basal half of femora yellowish; abdomen brownish yellow; wings with a faint yellowish tinge, immaculate; stigma pale; veins yellow; subcostal cross vein at the tip of the auxiliary vein, which is incurved toward the first vein and is opposite the inner end of the second submarginal cell; præfurca of moderate length about half as long as the first submarginal cell; marginal cross vein at tip of first longitudinal vein; petiole of first submarginal cell about equal in length with the posterior cross vein; inner end of the second submarginal, first posterior and discal cells nearly in one line; posterior cross vein at or near the middle of the discal cell; petiole of second posterior cell rather long but not quite as long as the cell itself. Length, male 7 mm.; wing 9.5 mm.

Habitat: Pa., six males. (Dietz.) Type no. 128. Wash. Agric. Coll. & S. of S.

***Limnophila badia*, sp. nov.** (Pl. VIII, fig. 5.)

Brown; head brownish gray; rostrum, palpi and antennæ brown; thorax brown; pleura hoary; halteres pale; legs tawny; femora lighter at base; abdomen brown, posterior margin of segments somewhat darker; wings with a very slight brownish tinge; stigma pale; veins brown with a short pubescence in the apical portion of the wing; tip of the auxiliary vein opposite the inner end of the second submarginal cell which is nearly in line with the inner end of the first posterior cell; marginal cross vein close to the tip of the first longitudinal vein; petiole of the first submarginal cell about as long as the posterior cross vein, the latter close to the middle of the discal cell; petiole of the second posterior cell short. Length, male 10 mm.; female 10 mm.; wing 10 mm.

Habitat: Olympia, Wash., three males, two females. (Kincaid.)
Type no. 129. Wash. Agric. Coll. & S. of S.

***Limnophila indistincta*, sp. nov.** (Pl. VIII, fig. 6.)

Brown; head darker brown; palpi dark brown; antennæ very light brown; dorsum of thorax yellowish brown; pleura darker brown; halteres pale, knobs slightly infuscated; legs very light brown; the tips of the femora and the tibia and the tarsi darker; abdomen brown; ovipositor ferrugineous; wings hyaline; stigma brownish,

rather distinct; veins brownish with a short pubescence in the apical portion of the wings; subcostal cross vein at the tip of the auxiliary vein; the marginal cross vein a short distance before the tip of the first longitudinal vein (in the single specimen before me the marginal vein is very faint and can hardly be distinguished); petiole of the first submarginal cell short; the inner end of the second submarginal cell is in a line with the inner end of the first posterior cell; petiole of the second posterior cell but a little shorter than the cell itself. Length, female 7 mm.; wing 6.5 mm.

Habitat: Collins, Ida., one female. (Piper.) Type no. 130. Wash. Agric. Coll. & S. of S.

Phyllolabis obscuris, sp. nov. (Pl. VIII, fig. 7.)

Yellow; head yellow, brownish above; palpi and antennæ brown; the yellow on the dorsum of the thorax almost concealed by the three broad brown stripes, the lateral ones extending back of the suture; scutellum and metanotum brownish; pleura pale yellow; halteres pale, knobs brown; legs tawny; femora, tibia and the tarsi darker toward the tips; abdomen brown above, pale yellow below; ovipositor yellowish; wings long, narrow, hyaline; stigma pale brown; auxiliary vein ends nearly opposite the origin of the prefurca; subcostal cross vein near its tip; no marginal cross vein; first submarginal cell about half as long as second; inner ends of the second submarginal and first posterior cells in a line; four posterior cells; discal cell closed; posterior cross vein some distance before the middle of the discal cell. Length, female 5 mm.; wing 6.5 mm.

Habitat: Pullman, Wash., one female. (Doane.) Type no. 131. Wash. Agric. Coll. & S. of S.

Eriocera parva, sp. nov. (Pl. VIII, fig. 8.)

Black; head and palpi black; antennæ very dark brown; thorax black with a grayish bloom; dorsum with three indistinct stripes, the median one much the broadest; pleura and metanotum shiny black; halteres pale; legs very dark brown; abdomen shining black; forceps of male brownish; wings with a brownish tinge; stigma pale; veins brown; prefurca arising from the first longitudinal vein at a very obtuse angle; marginal cross vein before the inner end of the first submarginal cell; which is only about half as long as the second submarginal cell; discal cell more than twice as long as broad; four posterior cells; posterior cross vein near the inner end of the discal cell. Length, male 5 mm.; wing 7 mm.

Habitat: Stanford Univ., Cal., one male. Type no. 132. Wash. Agric. Coll. & S. of S.

Eriocera austera, sp. nov. (Pl. VIII, fig. 9.)

Very dark brown; head with a grayish bloom; rostrum and palpi black; antennæ very dark brown, first segment darker, third segment longest, equal in length to the fourth and fifth together; thorax with a grayish bloom; the three brown stripes on the dorsum are indistinct; metanotum shining black; halteres pale; legs dark brown; femora, tibia and tarsi darker towards tips; abdomen and forceps of male very dark brown; wings with a brownish or grayish tinge; all the cross veins, the

origin of the præfurca and the tips of nearly all the longitudinal veins with brown clouds; the posterior veins faintly bordered with brown; veins brown; origin of the præfurca with the stump of a vein; tip of the auxiliary vein nearly opposite the inner end of the second submarginal cell which is considerably longer than the first submarginal cell; marginal cross vein just a little beyond the base of the latter cell; four posterior cells; posterior cross vein near the inner end of the discal cell. Ten of the seventeen specimens that I have before me show these markings; five of the others have the discal cell open and the other two have the discal cell closed, but have a brown spot on the posterior side of the middle of the fourth longitudinal vein and another in the axillary cell. These were all collected on the same date. Length, male 7 mm.; wing 7 mm.

Habitat: Olympia, Wash., seventeen males. (Kincaid.) Type no. 133. Wash. Agric. Coll. & S. of S.

***Eriocera gibbosa*, sp. nov.** (Pl. VIII, fig. 10.)

Dark brown; head with a grayish bloom; frontal gibbosity large; rostrum yellowish; palpi black; antennæ black, first and second segments yellowish brown; thorax grayish brown with four indistinct brown stripes; halteres brown; legs yellowish brown; femora lighter toward the base; tarsi black; abdomen black or grayish brown; forceps of male of same color; ovipositor ferrugineous; wings with a brownish tinge; stigma and veins darker brown; tip of the auxiliary vein opposite the inner end of the second submarginal cell which is much longer than the first submarginal cell; marginal cross veins at the inner end of the latter; four posterior cells; discal cell short; posterior cross vein near its inner end. Length, male 10 mm., female 12 mm.; wing 11 mm.

Habitat: Michigan, two males, one female. (Aldrich.) Type no. 134. Wash. Agric. Coll. & S. of S.

***Eriocera velveta*, sp. nov.** (Pl. VIII, fig. 11.)

Brown; head grayish brown; rostrum, palpi and antennæ brown, basal joint of latter lighter; thorax grayish brown; dorsum with six stripes, the lateral pair low down on the lateral margins; the pleura sometimes with brownish spots where the gray bloom has been rubbed off; halteres brown; legs brown; basal two thirds of femora reddish brown; abdomen and forceps of male velvety brown; ovipositor ferrugineous; wings with a brownish tinge; stigma but a little darker; veins brown; the subcostal cross vein a short distance before the tip of the auxiliary vein; the tip of the latter nearly opposite the inner end of the first submarginal cell; the distance from the marginal cross vein to the inner end of the first submarginal cell about equal to the petiole of this cell; four posterior cells; posterior cross vein a little before the middle of the discal cell. Length, male 10 mm., female 13 mm.; wing 10 mm.

Habitat: Colorado, one male, one female. (Morrison.) Type no. 135. Wash. Agric. Coll. & S. of S.

A single specimen from Olympia, Wash., seems to belong to this species, but it is much larger, and darker in every respect and without any apparent stripes on the dorsum. It may be a distinct species.

Eriocera antennaria, sp. nov. (Pl. VIII, fig. 12.)

Brownish yellow; head reddish yellow; palpi rather short, brown; antennæ about once and a half the length of the body, first and second segments reddish yellow, other segments brown; the third if bent back would reach a little beyond the base of the wings; all the segments beyond the second with a fine short dense pubescence; those beyond the middle with a few scattered fine hairs which become more numerous toward the tip; thorax brownish yellow; dorsum with four obscure brown stripes; a narrow dark line from the collar to the base of the wing; halteres yellowish brown; legs yellowish; tarsi and tips of tibia and femora brown; abdomen and male forceps brownish yellow; wings with a very faint tinge which in some lights is yellowish, in others whitish; stigma pale; veins brown; tip of auxiliary vein opposite the inner end of the second submarginal cell; distance of the marginal cross vein from the inner end of the first submarginal cell a little less than the length of the petiole of this cell; four posterior cells; posterior cross vein before the middle of the discal cell; discal cell open in one specimen. Length, male 8 mm.; wing 10 mm.

Habitat: Columbus, Ohio, four males. (Hines.) Type no. 136. Wash. Agric. Coll. & S. of S.

Eriocera aurata, sp. nov. (Pl. VIII, fig. 13.)

Reddish yellow; head slightly darker; palpi rather long, broad, lighter toward the base; antennæ brownish yellow, same length in male and female, if bent back they would about reach the base of the wings; thorax reddish yellow, a faint brownish spot just before, and another just above the base of the wings; halteres reddish yellow, knobs brown; legs yellowish; tarsi and the tips of the tibia and the femora brown; abdomen and genitalia reddish yellow; wings with a deep yellowish tinge; stigma brown; tip of the auxiliary vein opposite the inner end of the first submarginal cell; the distance between the marginal cross vein and the inner end of the first submarginal cell is a little more than the length of the petiole of this cell; four posterior cells; posterior cross vein before the middle of the discal cell. Length, male 11 mm.; female 16 mm.; wing 12 mm.

Habitat: North Carolina, one male, one female. (Morrison.) Type no. 137. Wash. Agric. Coll. & S. of S.

Amalopsis exoloma, sp. nov. (Pl. VIII, fig. 14.)

Brown; head, palpi and antennæ black; dorsum of thorax grayish brown; with three darker brown stripes, the median one divided; pleura and the metanotum gray; halteres light, knob infuscated; legs brownish, base of femora lighter; abdomen brown; forceps of male but little lighter; wings hyaline with two brown spots; the first is the smallest and is over the origin of the præfurca, the second covers that portion of the wing beyond the inner end of the first submarginal cell and in front of the second submarginal cell except for a small hyaline spot in the outer marginal cell; the subcostal cross vein, which is a considerable distance in front of the origin of the præfurca, is nearly bordered with brown; first submarginal cell longest; the small cross vein connecting the third and fourth longitudinal veins; five posterior cells, the second with rather a long petiole; veins brown. Length, male 9 mm.; wing 11 mm.

Habitat: Pullman, Wash., two males. (Doane.) Type no. 138. Wash. Agric. Coll. & S. of S.

Amalopsis vitripennis, sp. nov. (Pl. VIII, fig. 15.)

Brown; head brown; rostrum and palpi darker; antennæ light brown, basal segments somewhat darker; thorax grayish brown with three brown stripes, the median one divided; halteres pale; legs brownish yellow; tarsi and tips of the tibia darker; abdomen brown; forceps of male also brown; ovipositor ferrugineous; wings hyaline; veins and stigma brown; first submarginal cell much longer than the second; five posterior cells; discal cell closed; small cross vein nearly as long as the posterior cross vein, slightly arcuated. Length, male 8 mm.; female 9 mm.; wing 11 mm.

Habitat: Wawawai, Wash., one male, one female. (Type.) (Doane.) Olympia, Wash., two males, two females. (Kincaid.) Type no. 139. Wash. Agric. Coll. & S. of S.

Amalopsis disphana, sp. nov. (Pl. VIII, fig. 16.)

Brown; head brown; vertex, palpi and antennæ darker brown; thorax grayish brown, with three distinct broad brown stripes; halteres pale; knob infuscated; legs brown; base of femora lighter; abdomen dark grayish brown; male genitalia darker brown; ovipositor ferrugineous; wings with a brownish tinge; veins and stigma brown; first submarginal cell but little longer than the second; anterior cross vein short, connecting the third and fourth longitudinal veins; five posterior cells; discal cells closed. Length, male 8 mm., female 9 mm.; wing 11 mm.

Habitat: Pullman, Wash., one female. (Type.) (Doane.) Olympia, Wash., four males, one female. Seattle, Wash., one male. (Kincaid.) Type no. 140. Wash. Agric. Coll. & S. of S.

Amalopsis ampla, sp. nov. (Pl. VIII, fig. 17.)

Ochraceous; head brown; rostrum and palpi darker brown; antennæ reddish brown; first segment more yellowish; thorax ochraceous, with three brownish stripes, the median one is very broad and distinct, usually divided; the lateral ones are less distinct, sometimes being indicated only on the back of the suture; halteres pale, knobs slightly infuscated; legs yellowish; the tarsi and the tips of the tibia and the femora brown; abdomen light brown, with a short golden yellow pubescence; posterior and lateral margin of each segment, and the forceps of the male yellow; the single female that I have before me has a much lighter, almost yellowish abdomen with a darker brown stripe along the middle; ovipositor ferrugineous; wings, especially in the anterior portion, with a brownish tinge; veins brown with a short pubescence in the apical portion; prefurca with a stump of a vein at its origin; the first submarginal cell longer than the second; the second posterior cell petiolate; posterior cross vein near the base of the discal cell. Length, male 20 mm., female 24 mm.; wing 17 mm.

Habitat: Seattle, Wash., eight males, one female. (Piper.) Type no. 141. Wash. Agric. Coll. & S. of S.

Very like *A. calcar* but nearly twice the size and darker.

Amalopsis constans, sp. nov. (Pl. VIII, fig. 18.)

Ochraceous; head darker; frontal gibbosity, rostrum and palpi brown; antennæ pale yellowish; dorsum of the thorax pale ochraceous with three broad darker stripes, the median one divided; all of the portion back of the suture, except the scutellum, brownish; pleura pale ochraceous; halteres yellowish; legs yellowish; tips of the femora, tibia and tarsi infuscated; abdomen brownish toward the tip; genitalia brown; wings, especially in the anterior portion, with a brownish tinge; the origin of the præfurca, all of the cross veins, the bases of the first and second submarginal and the posterior cells, and the tips of the auxiliary and the first longitudinal veins, clouded with brown; first submarginal cell shorter than the second; second posterior cell sessile; posterior cross vein near the inner end of the discal cell; veins brownish yellow. Length, male 18 mm.; female 20 mm.; wings 17 mm.

Habitat: Olympia, Wash. (Type.) Seattle. (Kincaid.) Tokeland, Wash., and South Bend, Wash. (Doane.) Type no. 142. Wash. Agric. Coll. & S. of S.

Dicranota argentea, sp. nov. (Pl. VIII, fig. 19.)

Brown; head grayish brown; vertex, front of gibbosity, palpi and antennæ darker brown; dorsum of thorax grayish brown with three dark brown stripes, the median one very broad; pleura and metanotum silvery gray; halteres pale, knob brown; legs dark brown; tarsi and tips of tibia and femora almost black; base of femora yellowish; abdomen grayish brown; ovipositor ferrugineous; wings hyaline; stigma brown, filling the space between the two marginal cross veins; auxiliary vein ends in the costa in the stigma; first marginal cross vein close to the base of the first submarginal cell, second at the tip of the first vein; second submarginal cell but little longer than the first posterior cell; five posterior cells; discal cell open, coalescing with the third posterior cell. Length, female 9 mm.

Habitat: Seattle, Wash., one female. (Kincaid.) Type no. 143. Wash. Agric. Coll. & S. of S.

Polyangæus, gen. nov.

Two submarginal cells; five posterior cells; discal cell open, coalescing with third posterior cell; two marginal cross veins between the first and second veins; supernumerary cross veins in the first and second submarginal cells and in the second basal cell; subcostal veins some distance before the origin of the præfurca; præfurca short, strongly arcuated at the base; first submarginal cell shorter than the second; antennæ 13-jointed; if bent back they would not reach beyond the collar; front very broad posteriorly, rapidly narrowing anteriorly, without distinct gibbosity; eyes with a very short pubescence, contiguous below; rostrum and palpi short; tibia with short spurs at the tip.

Belongs to the group of *Amalopina* with 13-segmented antennæ and discal cell open. The description of this genus is based on a single specimen which may be further described as follows:

Polyangæus maculatus, sp. nov. (Pl. VII, fig. 20.)

Brown; head darker brown; palpi and basal segments of antennæ brown; other segments pale; thorax grayish brown; the dorsum almost covered by the three darker brown stripes; halteres and feet pale; tips of the femora, tibia and tarsi, and sometimes the base of the tibia also, brown, abdomen brown, lighter toward the base, wings hyaline; with brownish spots on the origin of the præfurca, at the base of the second submarginal and the first posterior cells, at the tip of the auxiliary vein and on nearly all the cross veins; stigma pale; auxiliary vein ends in the costa opposite the first marginal cross vein; petiole of first submarginal cell about the length of the posterior cross vein; inner end of the second submarginal cell but little before the inner end of the first posterior cell; the supernumerary cross veins in the submarginal cells seem to draw the veins which they connect toward each other; second posterior cell short; posterior cross vein before the inner end of the discal cell; seventh vein very slightly sinuate. Length, male 4 mm.; wing 5 mm.

Habitat: Seattle, Wash., one male (type). Olympia, one male. (Kincaid.) Type no. 144. Wash. Agric. Coll. & S. of S.

Cylindrotoma splendens, sp. nov. (Pl. VIII, fig. 21.)

Pale yellow and black; head very pale yellow almost whitish; occiput, front, rostrum and palpi brown; first and second segments of antennæ whitish, first with a brown ring, other segments brown, cylindrical, if bent back they would reach to about the middle of the first abdominal segment; thorax very pale yellow or whitish; dorsum with three opaque black stripes; the lateral ones merge anteriorly into broader brown stripes which curve in and meet the median stripe; collare with a black band; a large black spot on the pleura between the base of the wing and the anterior coxæ, another over the anterior coxæ, and another between the first and second pair of coxæ; a smaller one just in front of the base of the halteres, and a double on the posterior border of the metanotum; scutellum with a median brown stripe; halteres pale, slightly infuscated above and at the tips; legs brown, base of femora lighter; tarsi and tips of the tibia darker; abdomen black; male forceps large, brownish posteriorly; wings rather narrow, hyaline; stigma pale; veins brown; auxiliary vein ends abruptly just before the stigma; the small cross vein connecting the first longitudinal vein with the costa is very faint and situated a little beyond the middle of the stigma; submarginal cell either longer or shorter than the first posterior cell. (In two of my specimens it is longer in one wing and shorter in the other.) Thus the præfurca may either end in the submarginal cell or in the first posterior cell; five posterior cells, the second sessile; discal cell elongated, somewhat pointed anteriorly; posterior cross vein a little before the middle of the discal cell; fifth vein incurved at the tip. Length, male 9 mm.; wing 9 mm.

Habitat: Unalaska, three males. (Kincaid.) Type no. 145. Wash. Agric. Coll. & S. of S.

EXPLANATION OF PLATES.

Wings number 14 and 15 on plate VII are magnified about three and three-fourths times; all others five and one-fourth times. Numbers 6, 7, 20 and 21 on plate VIII are magnified about five and one-fourth times; all others three and three-fourths times. The drawings were made by Mrs. Nora Cooper Doane.

PLATE VII.

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| Fig. 1. <i>Dicranomyia ochracea</i> , sp. nov. | Fig. 12. <i>Dicranomyia duplicata</i> , sp. nov. |
| Fig. 2. <i>Dicranomyia cinerea</i> , sp. nov. | Fig. 13. <i>Geranomyia distincta</i> , sp. nov. |
| Fig. 3. <i>Dicranomyia citrina</i> , sp. nov. | Fig. 14. <i>Trochobola elegans</i> , sp. nov. |
| Fig. 4. <i>Dicranomyia helva</i> , sp. nov. | Fig. 15. <i>Dicranoptycha borealis</i> , sp. nov. |
| Fig. 5. <i>Dicranomyia isabellina</i> , sp. nov. | Fig. 16. <i>Rhypholophus fusiformis</i> , sp. nov. |
| Fig. 6. <i>Dicranomyia brunnea</i> , sp. nov. | Fig. 17. <i>Rhypholophus manicatus</i> , sp. nov. |
| Fig. 7. <i>Dicranomyia gracilis</i> , sp. nov. | Fig. 18. <i>Rhypholophus lanuginosus</i> , sp. nov. |
| Fig. 8. <i>Dicranomyia moniliformis</i> , sp. nov. | Fig. 19. <i>Rhypholophus fumatus</i> , sp. nov. |
| Fig. 9. <i>Dicranomyia fulva</i> , sp. nov. | Fig. 20. <i>Erioptera comata</i> , sp. nov. |
| Fig. 10. <i>Dicranomyia stigmata</i> , sp. nov. | Fig. 21. <i>Gonomyia virgata</i> , sp. nov. |
| Fig. 11. <i>Dicranomyia infusata</i> , sp. nov. | Fig. 22. <i>Cryptolabis bisinuatus</i> , sp. nov. |

PLATE VIII.

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| Fig. 1. <i>Limnophila flavapila</i> , sp. nov. | Fig. 12. <i>Eriocera antennaria</i> , sp. nov. |
| Fig. 2. <i>Limnophila nigritinea</i> , sp. nov. | Fig. 13. <i>Eriocera aura</i> a, sp. nov. |
| Fig. 3. <i>Limnophila superlineata</i> , sp. nov. | Fig. 14. <i>Amalopsis exolema</i> , sp. nov. |
| Fig. 4. <i>Limnophila lutea</i> , sp. nov. | Fig. 15. <i>Amalopsis vitripennis</i> , sp. nov. |
| Fig. 5. <i>Limnophila budia</i> , sp. nov. | Fig. 16. <i>Amalopsis diaphana</i> , sp. nov. |
| Fig. 6. <i>Limnophila indistincta</i> , sp. nov. | Fig. 17. <i>Amalopsis ampla</i> , sp. nov. |
| Fig. 7. <i>Phyllolabis obscuris</i> , sp. nov. | Fig. 18. <i>Amalopsis constans</i> , sp. nov. |
| Fig. 8. <i>Eriocera parva</i> , sp. nov. | Fig. 19. <i>Dicranota argentea</i> , sp. nov. |
| Fig. 9. <i>Eriocera austera</i> , sp. nov. | Fig. 20. <i>Polyangenus maculatus</i> , gen. nov. |
| Fig. 10. <i>Eriocera gibbosa</i> , sp. nov. | et sp. nov. |
| Fig. 11. <i>Eriocera velveta</i> , sp. nov. | Fig. 21. <i>Cylindrotoma splendens</i> , sp. nov. |

NOTE ON *Trypeta notata*.

On March 3d, of the present year, I collected a number of galls on *Bigelovia* (*Chrysothamnus*) *graccolens* (sens. lat.) at Santa Fé, New Mexico. They were spherical, about 9 mm. diam., with a lateral pointed protuberance; surface rather thinly covered with appressed wool-like hairs. In due time I bred from these galls numbers of the flies, which I took for a new *Eurosta*; but Mr. Coquillett has kindly compared them with his *Trypeta notata*, JN. N. Y. ENT. Soc., Dec., 1899, p. 262, and finds them identical.

T. D. A. COCKERELL.

NEW GENERA AND SPECIES OF AMERICAN
PHALANGIDA.

BY NATHAN BANKS.

Hadrobunus, gen. nov.

Body large; legs moderately slender, femur I much shorter than body, in female shorter than width of body, several false articulations in metatarsus I. Eyes of normal size, eye-tubercle of moderate size and with a few denticles above. No spines on anterior margin of the cephalothorax. Palpus without spines, last joint longer than penultimate, palpal claw dentate. The lateral pore opens upward. The dorsal integument is moderately hard. The abdomen shows a faint vase-mark.

Type—*Phalangium grande* Say.

This genus differs from *Liobunum* in shorter legs, from *Leptobunus* in the dentate palpal claw, and number of pale articulations in metatarsus I.

Leuronychus, gen. nov.

Similar in most respects with *Liobunum*, but with the palpal claw smooth, and without the lateral rows of teeth on the coxæ. It differs from *Leptobunus* in the longer legs. The mouth-parts are like *Liobunum*.

Type—*Liobunum pacificum* Banks.

Liobunum crassipalpis, sp. nov.

♂ Pale grayish above, with many small scattered brown spots, and a very distinct brown median vitta from the eye-tubercle to tip of abdomen, and scarcely enlarged in the middle; palpi pale yellow; venter and coxæ grayish white, trochanters brown, legs pale yellowish, patellæ and tips of tibiæ brownish.

Body long, tapering behind; eye-tubercle remote from the anterior margin, with a few small denticles above; palpi of normal length, the femur, patella and tibia plainly incrassate, the femur about two and one-half times as long as broad, plainly curved, all with denticles, the row on tarsus quite large; legs of moderate length, femur I as long as body, coxæ with some scattered granules, beside the usual row on each margin. Length 7.5 mm.

One specimen, probably from Washington, D. C.

Related to *Liobunum vittatum* Say, but distinct from that as well as from all our other species by the thick basal joints of the palpus.

Liobunum denticulatum, sp. nov.

Dorsum whitish, with a broad dark brown vase mark from eye-tubercle to tip of abdomen, giving off each side some brown marks which traverse the pale of the sides; coxæ and venter whitish; palpi and mandibles pale yellowish, trochanters and extreme bases of femora very dark brown, rest of legs pale yellowish, except the brown patellæ and a brown band on apex of each tibia; eye-tubercle of good size, remote

from the anterior margin, denticulate above; palpi rather longer than usual, in the male especially so, the femora being very long and curved, the tibia below, with a row of fine teeth, the tarsus curved; legs long and slender denticulate in rows on basal joints; abdomen of male rather small. Length, 5 mm.

Cuernavaca, Morelos, Mexico [Barrett].

Liobunum consimilis, sp. nov.

Dorsum brown, with some pale patches, no distinctive vase-mark; eye-tubercle small, without teeth; palpi pale yellowish; trochanters light brown, legs nearly uniform yellowish brown, the patellæ no darker, the tarsi rather lighter; male similar to female, but the legs are brown or nearly black, except on bases of femora; palpi not very long. Length, ♀ 5.5 mm.; ♂ 4.5 mm.

Cuernavaca, Morelos, Mexico [Barrett].

Hoplobunus, gen. nov.

Palpi armed above and below on femora with teeth, laterally on tibiae and tarsi with bristle-bearing spines, a long claw at end of tarsus; mandibles very large, in the male enormous; hind coxæ not very large, the spiracles each side distinct; legs I and II slender, III and IV stouter and roughened, trochanter III plainly larger than others, metatarsus IV the longest; eye-tubercle large and on the anterior margin of cephalothorax, tipped with a spine, the eyes each side at base.

Type—*H. barretti*.

Hoplobunus barretti, sp. nov.

Cephalothorax yellow brown, blotched and veined with black; palpi and mandibles yellowish; legs yellowish brown, anterior pairs brown beyond base, segments of abdomen above and below brownish on apical part, yellowish on basal part; eye-tubercle large; close to anterior margin, conical, tipped with a prominent flattened tooth, eyes rather small at base of tubercle; mandibles large, first joint above with several teeth, in the male the second joint is enormous, very high above, reticulate with brown; femur of palpus compressed, with two rows of teeth above, the last of the inner row much larger than the others, below with many irregular teeth, patella short, roughened, tibia depressed, nearly as broad as long, each side with bristle-bearing tubercles, tarsus short, depressed, tipped with a long claw, nearly as long as the joint, each side of tarsus with a few bristle-bearing tubercles; legs roughened, pairs I and II slender; III with a very large trochanter, with a tooth in front and several behind, the femur with an angle at base below, and beyond roughened and toothed; patella with a large tooth below (not present in female); IV trochanter smaller than III, with a large tooth each side at tip, femur with a large tooth at base and apex below, a large one under patella, and two at tip of tibia (in female these are practically absent); each abdominal segment above and below bears a row of granules. Length without mandibles, 6.5 mm.

Cuernavaca, Morelos, Mexico [Barrett].

Scotolemon californica, sp. nov.

Pale, yellowish, dorsum of abdomen rather darker. Dorsum with small pointed granules, those on abdomen in transverse rows; eye-tubercle low, rounded, with

small granules close to the anterior margin, no eyes. Venter and coxæ with similar granules, often giving rise to a fine hair. Palpus large, stout; femur more than twice as long as broad, with about four pointed tubercles above and below on outer side 3 long spines toward base, one on inner side toward tip; patella nearly as long as the tibia, four tubercles above, and below on each side one long spine; tibia about two and one-fourth times as long as broad, with three spines below on each side, the middle one much the largest, the apical one next in size; tarsus about three-fourths the length of the tibia, with two spines below on each side, the basal one the larger; claw slender, nearly one-half as long as the tarsus. Mandibles with some tubercles in front and above. Legs slender, finely granulate; femur I reaches to tip of femur of palpus; the patellæ are larger than the other joints and quite long, the tarsus is divided into long slender joints, all clothed with fine short hairs. The posterior margin of each abdominal segment above and below is elevated. Length, 1.8 mm.

Several specimens from Alabaster Cave, California [Marx].

NOTES ON OVA AND LARVA OF HYPERCHIRIA PAMINA.

BY DR. R. E. KUNZÉ.

While collecting in Prescott, Ariz., found a ♀ *Pamina*, June 23, 1898, which oviposited, June 24th, one hundred eggs. I retained thirty, which hatched twenty days later, July 13th, 8 A.M., exact time for first larvæ to appear. I sent sixteen ova to Professor Packard, and gave the others to a friend on the Summit Mountains to raise if possible. Nights were very cool, and thought that no ova would hatch, so long in coming out.

Ovum white, a black spot on top. Length, 2 mm. Width, $1\frac{3}{4}$ mm. Shape subconical, depressed on sides. Ova laid in piles composed of parallel rows.

Young larvæ after hatching: length $5\frac{1}{2}$ –6 mm. when in motion, and 4 mm. at rest. Width of body $\frac{1}{3}$ mm. Color dull orange or buff, head black. Dorsum with double row of gray tubercles, surmounted by black bifurcated spine. A subdorsal row of tubercles of a greenish-gray. Lateral parts below covered with whitish hair. Head shining black, covered sparsely by whitish hair. Thoracic and prolegs concolorous with body. A few hours after hatching larva changed to a brownish color, spines black. Larvæ were fed on *Quercus undulata*.

I had to return to Phoenix, where oak does not grow, and therefore gave *Salix fluviatilis* for larvæ to feed upon. Only fifteen accepted the change of food. The others gradually died between July 18th and 21st, and July 23d all were dead.

Larva eight days old. Head shining black, covered with whitish hair; round in shape. Ground color of body, which is cylindrical, light umber-brown all over, inclined to lighter tints on abdominal parts. Dorsal and lateral parts covered by bunches of spines, which like the shafts are black. Two rows of dorsal shafts and one each subdorsal. Segments 2 to 4, each bear a transverse row of four bunches of stinging spines. Shaft bifurcated, fork two-thirds as long as the stem, tip surmounted by a long, black, curved spine, and some of dorsal row by two spines. Shafts of segment 2 not so long as of 3 and 4. Segments 5 to 13 each contains a transverse row of four black, tuberculous shafts, each bearing a spine, and those of dorsal row a second rudimentary one. The subdorsal shafts only half so long as those of two dorsal rows. Thoracic legs darker than prolegs. Body sparingly covered by whitish secondary hairs. Length of larva at rest 6 mm., in motion 7 mm. Width 1 mm.

All the other larvæ died inside of two weeks, although feeding constantly on *Quercus undulata*, an oak they are mostly found on.

On my next trip to Prescott I found forty-nine spinose, black-looking larvæ on *Quercus undulata*, August 8, 1898, which proved to be *Paminta*. These were gregarious and when disturbed dropped to the ground. They would follow one another like *H. io*, but did not rest in similar rows, more sardine-fashion. Apparently the larvæ represented the beginning of third stage. Examined larvæ August 11th, at noon. Length of larvæ 16 mm. at rest and 18 mm. when in motion. Width across middle of body 3 mm., and that including spines 5 mm. Antennæ brown, mouth parts light brown. Body covered by six longitudinal rows of black, tapering, spinulated tubercles, having on the largest of second joint 19-20 black, fleshy protuberances or spinules, each with a seta at the end. The two dorsal rows have longest tubercles. On segment 2, tubercles are 4 mm. long. Between the black spines of dorsal tubercles is a mass of whitish, woolly hair. Color of body sooty black. Head shining black. A fine white, interrupted dorsal stripe lines each side of both rows of the tubercles on dorsum. There is a white, uneven, interrupted double line between subdorsal and infraspicular row of tubercles.

Size of tubercles gradually tapers less toward abdominal segments. At the base of subdorsal and infraspiracular tubercles the spines are white and in bunches. Each segment from the first and including eleventh has six spinulated tubercles. Those of first are not quite so long as on second segment, but longer than any other. Head retracts into first segment. There are five tubercles on twelfth segment, and the dorsal ones longer than on any other joint. On the thirteenth segment are five spinulated tubercles, of which four in a row and the fifth placed behind the two dorsal ones on anal plate. Dorsal tubercles of same length as of twelfth segment. Thoracic legs black, feet brown. Prolegs reddish-brown, clasping surface covered by white hair. A longitudinal, reddish-brown stripe, enclosing a white line, passes centrally over entire abdominal surface.

I remained only one week in Prescott, and took three of the larvæ to Phoenix, for further observation, but all were dead by August 18th, when supply of oak gave out. I removed a small bush to Phoenix, planted in a shady spot, but it refused to live under all circumstances. My other larvæ of the same brood I left in Prescott, and these were fed up to transformation on *Quercus undulata*.

Observed that the tubercles of supra- and infraspiracular row were black, and that all spinules therefrom were white, with a white seta at the end. Of the dorsal rows of tubercles, the white spinules occupied the lower third of each tubercle. Could not distinguish spiracles with a magnifier. A triangular depression above the face, the apex of which meets the vertical line of forehead.

Sept. 9, 1898, received two nearly full-grown larvæ from Prescott for observation. Length of larva at rest 38 mm. Width 7 mm. Body of larva cylindrical. Head shining black, with median suture. A triangular depression on clypeus. Mouth parts blackish. Antennæ brownish. A few scattering hairs on lower part of face. Width of head $3\frac{1}{2}$ mm. Anterior part of 2d segment sooty, posterior half white with blackish patch in the middle. Between the subdorsal row of spines, a shining black ridge, with spur between dorsal and subdorsal bunch of spines. Ground color of the dorsal surface from segments 3-13, white, relieved by six longitudinal, broken black lines. The dorsal lines farther apart than subdorsal. In the middle of each segment back of the shaft of spines, are five transverse black dashes. Two of the central dashes are in a continuous broken line with the dorsal black lines. On segment 13, these transverse dashes are very

faint. On segments 5-11, between the dorsal tufts is an elongate black spot, with its long axis lateral. On segments 3 and 13, this black spot is quadrate, with long axis lengthwise. Subdorsally on segments 5-11, a broad, black interrupted band, its sections on the posterior part of joint 6 and anterior part of 7, forming a subquadrate spot; in the middle over the incisure is a white spot. An irregular, broken black subdorsal line passes over segments 3-5. An irregular, broken, black substigmatal line on segments 2-5, and on anterior half of segment 6. On posterior half of each segment an irregular, quadrate chestnut-colored, almost ferruginous spot, concolorous with abdominal feet. On the anterior half a similar, more triangular rusty spot. A black spot between ferruginous ones, dotted whitish. Each segment from 5-9, across the stigmatal line, is obliquely crossed on anterior part of each joint by two heavy white lines, enclosing a black dash. On posterior part of the segment from bunch of spines to incisure, is a narrow white line. The lateral parts of segments 2-5, below stigmatal tufts are sooty. Segments 2-6 has a substigmatal bunch of small, whitish spines, thus giving each joint 8 bunches. Segments 7-10, each has 6 spinose tufts or bunches. Segment 11 has 8 such tufts. Segment 12 has 7 tufts, the largest dorsally, and segment 13 has 5 tufts, the central one a little below subdorsal tufts, and of same length as the substigmatal tufts. Shafts all black. Lower third of each spinose tuft white, upper part black. Dorsal tufts of segments 2 and 3 are the longest, from 7-8 mm. Tufts of segment 13 are 7 mm. long. Stigmata light buff. Thoracic feet ferruginous and black. Abdominal legs blackish-brown, the feet ferruginous, covered by fine white hair. Abdominal parts brownish-red, enclosing a longitudinal whitish line. Supra-anal plate shining black above, edged white below and reddish-brown between white lines. Two white dashes on a line with subdorsal tufts of segment 13. Upper part of clasper black, below ferruginous, covered by fine white hair.

The largest larva measured in length at rest 43 mm., and in motion 48 mm. Width $6\frac{1}{2}$ mm. Occipital part of head greenish. A triangular greenish depression on clypeus. A greenish stripe passes obliquely across the face and nearly meets at triangle of the clypeus. Mouth-parts reddish. Above maxillary a transverse whitish bar. Antennæ reddish and white at base. The ground color of dorsal and lateral parts is made up of alternate, narrow longitudinal stripes of lavender and white, separated by black lines. On dorsum a lavender

stripe, bordered by a subdorsal white one. Then a very narrow lavender stripe on a line with right and left row of dorsal tuft of spines. Next, another white stripe followed by a substigmatal stripe, as broad as the one on dorsum. This is bordered by an irregular, alternate single and double white infrastigmatal stripe. This stripe is double on the anterior part of each segment, and passes obliquely downward toward the legs.

The lower part of shafts greenish white, terminal end black, surmounted by a black spine and seta. The longest shafts on segments 2, 3 and 13, are two-thirds black on top and greenish-white at the base. Lower two-thirds of all the spines of the tufts greenish-white, almost pea-green in tint, and tips of the upper and topmost spines black. The transverse black spot on dorsum of segments 5-11, surrounded by a pinkish tint. Spiracles cream-colored. Infraspiracular parts alternately marked by red and black patches, minutely dotted white. A broad black band across upper part of abdominal legs, red below and dotted white. Clasping surface red. Thoracic feet red and black. Abdominal parts reddish and finely dotted white, and a yellowish longitudinal stripe passing over all segments. Anal plate black and reddish, dotted white, the clasper reddish. Thoracic and abdominal feet covered by fine white hair.

Near Prescott I found this beautiful larva at an altitude of 5,400 feet and up to a little over 6,000 feet. The food-plants were *Quercus undulata*; *Ceanothus fendleri*: a white-flowered, prickly bush bearing red berries, *Cercocarpus parvifolius*, or Mountain Mahogany, a small shrub from 2-15 feet high, the bark of which is aromatic like winter-green; and in southern Arizona, of Huachuca Mts., found a few larvæ on *Quercus emoryi* or Black-jack Oak, which bears edible acorns. One larva was found on *Opuntia* spec., in Yavapai County.

PROCEEDINGS OF THE NEW YORK ENTOMOLOGICAL SOCIETY.

MEETING OF MARCH 7, 1899.

Held at the American Museum of Natural History.

President Love in the chair. Seven members present.

Dr. Ottolengui read a paper on Collecting in the Woods of Maine, illustrated by a series of photographs of the region. He stated that few noctuids were taken at sugar and light, but Geometridæ were more abundant, and of which he took about 200 specimens, representing 25 species. After discussion adjournment.

MEETING OF MARCH 21, 1899.

Held at the American Museum of Natural History.

President Love in the chair. Nine members present.

On motion it was proposed that Dr. R. Ottolengui be nominated as a candidate for the appropriation of \$50 from the John Strong Newberry fund for scientific researches.

Mr. Beutenmüller spoke on *Trochilium* (= *Egeria*) *tibiale* and allied species. He stated that *tibiale* was found from Canada, New Hampshire and northern New York westward to Vancouver Island and *T. apiformis* occurred as far west as Nevada. He pointed out the differences of the two species. They differ mainly in the bands on the abdomen and the markings on the thorax. *T. pacificum* has the abdomen wholly yellow, except the basal segments. He also exhibited a specimen of *Alcathoe caudata* var. *walkerii* and the types of the Sesidiæ described by T. W. Harris.

Mr. Shoemaker exhibited a number of rare noctuids taken by him at sugar on Long Island.

MEETING OF APRIL 4, 1899.

Held at the American Museum of Natural History.

In the absence of the President and Vice-President, Rev. J. L. Zabriskie was elected to act as chairman *pro tem*. Seven members present.

Rev. Zabriskie spoke on the stridulating organ of *Lema trilineata*, supplemented by specimens shown under the microscope, and blackboard drawings. The organ consists of a plate situated at the base of the pygidium and furnished with transverse elevated ridges. The sound is produced by rubbing the pygidium against the underside of the elytra, which is furnished with pointed elevations like the teeth of a file. Mention was also made of the stridulating organs of some Orthoptera. After discussion adjournment.

MEETING OF MAY 10, 1899.

Held at the American Museum of Natural History.

President Love in the chair. Nine members present.

Mr. Beutenmüller proposed Dr. D. M. Cammann for active membership.

It was proposed that a field meeting be held on May 27th-29th to the Ramapo Mts., N. Y.

Mr. Beutenmüller spoke on *Notolophus inornatus*, described by him some years ago from a worn example, and was placed as a synonym of *leucostigma* by Dr. Dyar.

During a short trip to St. Augustine, Fla., last April he took at the light-house on Anastasia Island a number of larvæ of *inornatus* from which he bred three males and a number of females. The species is without doubt distinct. It differs from *leucostigma* by having ochreous shades on the forewings and by the absence of the white spot. The egg mass is similar to that of *definitus*, and is not covered with white frothy substances as in *leucostigma*. Most of the larvæ were silvery gray, though a few were dirty yellow. *Orgyia falcata* Schaus, from Mexico, may prove to be the same as *inornatus*. Mr. Schäffer exhibited a specimen of *Psilopyga* from Arizona new to our fauna and which he thought was identical with *P. fasciata* from Mexico. It differs only from the description of that species in the less extent of the red fascia of the elytra. He also showed *Amphionycha flammata* and *Pogonocherus subhamatus*; *Eleusis pallida* and the closely allied *Triga picipennis*.

MEETING OF JUNE 6, 1899.

Held at the residence of Dr. R. Ottolengui, 155 E. 72d St.

President Love in the chair. Nine members present.

Dr. Cammann was elected an active member.

An invitation of the Feldman Society of Philadelphia to participate at a field meeting on July 4th at Anglesea was received and accepted with thanks.

Dr. Ottolengui showed a large series of *Plusia*, calling attention to many rare species of this genus of which he is making a specialty. He also exhibited many other fine species from his collection.

MEETING OF OCTOBER 3, 1899.

Held at the American Museum of Natural History.

President Love in the chair. Seven members present.

Messrs. George Franck, Richard Stutz and Miss M. E. Valpey were proposed for active membership.

Mr. Joutel exhibited the pupa of *Fenestica tarquinus* and the larvæ of *Scepsis fulvicollis*.

He also recorded the occurrence of *Crioceris 13-punctata* on Long Island, N. Y., and the capture of *Callida punctata* in Bronx Park, New York city; the latter species was also taken by Mr. Shoemaker on Long Island.

Dr. Love showed specimens of *Ommatostola lintneri* taken at Angelsea, N. J. He stated that Prof. J. B. Smith and himself had taken about forty specimens of this species and remarked that it was very unusual to find it in such quantity.

MEETING OF OCTOBER 17, 1899.

Held at the American Museum of Natural History.

President Love in the chair. Eight members present.

Messrs. George Franck and Richard Stutz, were elected active members.

Mr. Beutenmüller stated that he had taken *Schinia brevis* in Mosholu, N. Y., on the flowers of a blue aster. The insect when at rest selects the center of the flower, which color it very much resembles, making it somewhat difficult to detect the moth. He also spoke on the Peach-borer (*Sanninoidea exitiosa*) and its varieties. He stated that the species was named *Zygena persice* by Barton in 1807, but was unable to find a published record of the description of this insect under this name.

Mr. Joutel exhibited a few pieces of wood, showing the damages done by the white ant.

Mr. Schaeffer spoke on some species of *Cychrus* and stated that it was difficult to separate the females of certain species. In a large series of *Cychrus* (*andrewsii* and *ridingsii*) from North Carolina he said he was able to separate the males by the structure of the anterior tarsi, but failed to find any constant characters to separate the females. The form he took to be *ridingsii* agreed very well with the description of this species, except in size; it being of the same size, form and color as *andrewsii*, differing only by the narrow dilated front tarsi of the male. He also spoke on *Lebia furcata* and *vittata*. He thought that they were one and the same species, there being nothing in the descriptions of these two species to separate them, except the different form of the sutural and lateral vitta. A series of specimens from the museum collection were shown with intermediate forms connecting the two species in question. A number of *L. depicta* from Wyoming were also shown and which differ only from some *L. furcata* by the entirely black legs. *L. picta* seems to be very constant; in all the specimens seen no variation was observed.

MEETING OF NOVEMBER 21, 1899.

Held at the American Museum of Natural History.

President Love in the chair. Fifteen members and nine visitors present.

Mr. Beutenmüller exhibited a series of lantern slides of Lepidoptera and their transformations, in their natural attitudes and called attention to the importance of using the camera in the study of the habits of insects. About 100 slides were shown.

After discussion adjournment.

MEETING OF DECEMBER 5, 1899.

Held at the American Museum of Natural History.

President Love in the chair. Nine members and three visitors present.

Mr. Beutenmüller proposed Mr. W. P. Comstock for active membership.

Mr. Kearfott called attention to a trap for catching Noctuids. He also exhibited a box of rare Mexican Noctuids. Mrs. Slosson presented to the Society a lot of Florida Lepidoptera, to be sold for the benefit of the JOURNAL. A vote of thanks was extended to Mrs. Slosson for the generous donation.

MEETING OF DECEMBER 19, 1899.

Held at the American Museum of Natural History.

President Love in the chair. Ten members and four visitors present.

Mr. Comstock was elected an active member of the Society.

Professor John B. Smith spoke on "Underground Insects" and the method of studying them by means of plaster casts. The life-history of two bees was selected and the digging habits shown in some detail. *Colletes compacta* appears in spring and digs down from 24-40 inches before it makes a cell, another is started a few inches higher up, and the lower one is filled up by the sand, taken out the upper. A third and sometimes a fourth are made above that and all are filled up so that the young bees must dig through from 23-40 inches of sand to get to the surface. *Angochlora humeralis* makes clusters of cells and hatches out in midsummer, the females only hibernating. Their borings extend sometimes over five feet below the surface.

The casts were made by pouring plaster-paris in the entrance of the channel, the plaster being liquid enough to allow the same to flow down into the various cells. After the plaster becoming sufficiently hard a pit was dug some distance away from the nest and gradually the soil was removed towards the channel until the same was exposed on the side wall of the pit; they were ready for removal. It was illustrated by about 40 lantern-slides, showing the insects and the various kinds of cells made by these species.

A vote of thanks was extended to Professor Smith for his interesting paper.

Messrs. Kearfott, Davis and Münch were appointed as a committee to nominate officers for the following year.

MEETING OF JANUARY 2, 1900.

Held at the American Museum of Natural History.

Eight members present and Prof. J. B. Smith and Dr. Herman Strecker as visitors.

The committee on nominations appointed at the last meeting proposed the following officers for the year 1900: President, Wm. Beutenmüller; Vice-President, Chas. Palm; Treasurer, L. H. Joutel; Recording Secretary, Chas. Schaeffer; Corresponding Secretary, Ernest Shoemaker; Executive Committee: E. G. Love, J. L. Zabriske, H. Hug, R. Ottolengui and E. Shoemaker; Publication Committee; Wm. Beutenmüller, L. H. Joutel, C. Schaeffer and E. G. Love.

On motion, which was duly seconded and carried, the Recording Secretary was instructed to cast an affirmative ballot for the election of the officers as nominated, upon which they were declared elected.

Mr. Bird read a paper on Oviposition in the *Hydracia* and gave his experience in finding the larvæ of the species. They bore in stems and roots of various kinds of plants and are concealed entirely. To find them is very difficult for the inexperienced, but a close examination of a suspiciously broken twig, a withering stem, or a knotty swelling might result in finding a *Hydracia* larva. Before pupating some make an exit opportune for the moth, while others leave their burrows and change in the ground. The mode of oviposition of *H. rutila* which he observed were described. With the antennæ in constant motion in every crack and crevice that may furnish a proper shelter an egg is deposited. The oviposition did not continue after the third night and the number of eggs was about one hundred. *H. impecuniosa* places the eggs in a greater or lesser number at one point. *H. cataphracta* has the same habit as *H. rutila*. The early stages of four species—*marginidens*, *rutila*, *impecuniosa* and *cerusata* not known before were observed by him.

Dr. Ottolengui spoke on the genus *Calocampa*. He called attention to the importance of the study of the genitalia in defining the species.

All the known species were exhibited as well as drawings and microscopic slides of the male genitalia.

After discussion adjournment.

MEETING OF JANUARY 16, 1900.

Held at the American Museum of Natural History.

President Beutenmüller in the chair. Seven members and four visitors present.

Miss Valpey was elected an active member of the Society.

Mr. Archibald C. Weeks was proposed for active membership by Mr. Beutenmüller. The president nominated Dr. E. G. Love and C. F. Groth to serve as delegates to the Scientific Alliance; Messrs. Kearfott and Palm as Field Committee and Messrs. H. Hug, L. T. Münch and E. Shoemaker as Auditing Committee.

Mr. Southwick spoke on "Insect Tenants of our Houses and Grounds," illustrated by a series of lantern slides. He stated that the title of his paper was misleading and that it was his intention to show what could be done in the study of insects with the aid of the camera.

MEETING OF FEBRUARY 6, 1900.

Held at the American Museum of Natural History.

President Beutenmüller in the chair. Eight members present.

Mr. A. C. Weeks was elected an active member of the Society.

Mr. Kearfott proposed Rev. George D. Hulst for active membership.

Mr. Kearfott exhibited a lot of Lepidoptera collected in the pine barrens of Florida.

Mr. Schaeffer showed a collection of Scydmenidae and Pselaphidae collected by P. Jerome Schmitt, at St. Vincent, Pa.

MEETING OF MARCH 20, 1900.

Held at the residence of Dr. E. G. Love, 80 E. 55th St., New York.

In absence of the President Mr. Kearfott was elected to act as chairman, *pro tem*. Ten members present.

Rev. George D. Hulst was elected an active member of the Society.

Mr. Ernest J. Münch, Jr., was proposed for active membership by Mr. Beutenmüller.

Dr. Love exhibited a case of Lepidoptera illustrating insect mimicry. He stated that the insect which is mimicked by another possesses in many cases a very disagreeable taste to birds and other enemies. Mr. Hulst doubted the views of protective mimicry stating that a bird would never attack a butterfly, except in rare instances and that the mimicry is due to some causes yet unknown. Dr. Love also exhibited many cases of insects from his collection.

MEETING OF APRIL 3, 1900.

Held at the American Museum of Natural History.

President Beutenmüller in the chair. Eight members present.

Mr. Ernest J. Münch was elected an active member of the Society.

Dr. Ottolengui offered his residence as a place for the next auction sale of insects, which was accepted with thanks.

Mr. Chas. Palm invited the Society to have the next meeting at his residence.

After a discussion on general topics relating to the Society the meeting adjourned.

MEETING OF APRIL 17, 1900.

Held at the residence of Mr. Chas. Palm, 172 E. 64th St., N. Y.

President Beutenmüller in the chair. Seven members and one visitor present.

Mr. George Englehardt and Mr. Anson H. Weeks were proposed for active membership by Mr. Franck.

Mr. Beyer exhibited some rare species of Coleoptera taken by him in Florida.

Mr. Palm showed an interesting Parnid from Arizona, which probably would prove to be a new species.

Mr. Münch exhibited *Monotoma producta*, *Bryaxis abdominalis* and other material collected by him.

SPECIAL MEETING OF APRIL 26, 1900.

Held at the residence of Dr. R. Ottolengui, 155 E. 72d St., N. Y.

An auction sale of insects was held. About 200 specimens of Lepidoptera and Coleoptera were sold, amongst which were *Thecla acis*, *Melitæa maria*, *Timætes cleucha*, *Anæa portia*, *Eudamus zestos*, *Dilophonota caicus*, *Sphinx canadensis*, *Peresia thorates*, *Syntomis minima*, *Alypia zwittfeldii*, *Urapteryx floridata* and many other interesting species.

MEETING OF MAY 15, 1900.

Held at the American Museum of Natural History.

President Beutenmüller in the chair. Nine members present.

The auction committee reported that about \$50 was realized at the sale held April 26th.

Messrs. Weeks and Englehardt were elected active members of the society.

A vote of thanks was extended to the following members for their contributions of specimens for the auction sale of insects: Mrs. Slosson, Messrs. Palm, Kearfott, Love, Joutel, Doll, Ottolengui and Münch.

Mr. Beutenmüller spoke on the advisability of holding a reception in honor of the visiting entomologist of the American Association for the Advancement of Science and on motion Messrs. Barber, Love and E. J. Münch were appointed as a committee to make arrangements for such a reception.

Mr. Beutenmüller read a paper on Ovipositing of *Vanessa antiopea*, presented by Mr. Archibald C. Weeks (see ante, p. 181).

Mr. Schaeffer showed a new species of *Anomala* from Florida which belonged to the subgenus *Rhombonyx*. He also exhibited a new species of *Parnus* from Arizona.

A number of cases illustrating insect mimicry prepared by Dr. Lagai were exhibited.

MEETING OF JUNE 5, 1900.

Held at the American Museum of Natural History.

President Beutenmüller in the chair. Seven members present.

No business was transacted.

An informal discussion was held on various topics of insects.

SPECIAL MEETING OF SEPTEMBER 6, 1900.

Held at the residence of Mr. G. Beyer, 511 E. 117 St., N. Y.

President Beutenmüller in the chair. Seven members present.

The following resolutions were adopted in honor of Mr. Herman Loos, a member of the Society:

Resolved, That the members of the New York Entomological Society, with the deepest regret, record on their minutes their sincere sorrow at the death of their friend, Herman Loss.

Resolved, That by his death the Society has lost one of its most generous and amiable members, and desires to record its earnest tribute to a character endowed with the most honorable qualities of manhood.

Resolved, That the members of the Society earnestly extend to his bereaved family their sympathy and condolence, and with deference to their sorrow, express the hope that, to them, the inspiring remembrance of his many virtues will be a consolation to their affliction.

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**A TROPICAL TYPE OF ACRIDIAN NEW TO THE
UNITED STATES.**

BY SAMUEL H. SCUDDER.

Professor T. D. A. Cockerell sent me last May from New Mexico a pair of Acridians of a type wholly new to me, apparently belonging to a new genus, and even forming a group apart, intermediate between the tropical American *Aleuæ* and *Vilernæ* in that the fastigium of the vertex is deeply channeled and the hind femora are slender with the superior carina smooth; unlike the species in both these groups the tegmina are abbreviated and lateral. Unfortunately I have few species of either of these groups with which to compare it and must depend largely upon the tables and diagnoses of Stål and Brunner. It bears a superficial resemblance to a Pyrgomorphid, but is a true Acridian. The genus and species are described below.

Clematodes (*κλήμα, ἐίδος*), gen. nov.

Body elongate. Head porrect; face oblique, bent inward, the deeply channeled fastigium of the vertex protruding beyond the eye by more than half (♂) or nearly the whole of (♀) the width of the eye, paraboloid in front, with large triangular, somewhat elongate lateral foveolæ, facing upward and outward, their plane at right angles with the tempora, the inner margin arcuate; frontal costa narrow, subequal, deeply sulcate with carinate margins, percurrent, widening a little below; lateral carinæ of the face prominent, scarcely divergent below; eyes rather large, prominent, especially in the male, ovate, oblique or obliquely subvertical; antennæ stout and thick, not so long as head and pronotum together, tapering (especially in female) from base to a rather blunt apex, triquetral nearly throughout, punctate. Pronotum compressed-cylindrical, feebly enlarging from in front backward, multicarinate, the front margin slightly raised to embrace the head, the hind margin distinctly and angularly emarginate, the lateral lobes considerably longer than deep, with nearly straight and nearly horizontal lower margin, and roundly continuous with the disk; prozona nearly (♀) or quite (♂) twice as long as metazona, the sulci distinct and percurrent, the anterior sulcus crossing only the disk. Prosternal spine moderate, tri-

quetral, blunt, especially in female; mesosternal lobes subquadrate, rounded at inner apical margin, separated by their own width (♀) or by less than that (♂); metasternal lobes subattaching (♂) or distinctly separated (♀). Tegmina slender lanceolate, lateral, with prominent longitudinal veins, reaching the third abdominal segment. Fore and middle legs rather short; hind legs long and rather slender, the hind femora tapering very regularly, not very strongly compressed, with smooth superior carina and bluntly acuminate genicular lobes, angulate mesially beneath; hind tibiae pilose, with 8-9 spines on either margin, the apical spine wanting on the outer side, the margins rounded. Abdomen compressed, elongate, tapering, multicarinate.

Clematodes larreae (Cock. sp.), sp. nov.

Gray of the exact tint of the stems of *Larrea* on which it was found, the gray everywhere made up of black and white marbling in little long oval patches largely lost in desiccation, pallid beneath; eyes with the same marbling in life; after death the whole becomes fuscous, irregularly and feebly mottled with testaceous, all the elevated parts black. Fastigium of vertex carinate in front, the vertex also with a median carina which extends forward nearly to the front border of the eyes, and is bordered by a smooth space, and this by a heavily punctate band posterior to the hinder extremity of the lateral carinate margins of the fastigium, which are just above the middle of the eyes. Pronotum rugose by longitudinal rugae in which a median carina is easily distinguishable and a number of broken subordinate carinae, both on disk and lateral lobes. Tegmina extending to just beyond the base of the hind legs. Hind femora extending posteriorly a little beyond tip of abdomen, mottled and with obscure fuscous fasciation, the lighter colors principally above, the inferior sulcus bright crimson (♀), or orange (♂), the latter fading to luteous after death.

Length of body, ♂, 21 mm., ♀, 37 mm., antennae, ♂, 7 mm., ♀, 8 mm.; hind femora, ♂, 12 mm., ♀, 15 mm.

1 ♂, 1 ♀, Messilla Park, N. Mex., May 22, T. D. A. Cockerell.

"I was yesterday afternoon," writes Mr. Cockerell, "on my back under a *Larrea* bush, watching the great red-eyed bees visit the flowers. As I looked up it gradually dawned upon me that there was something Orthopterous on one of the *Larrea* stems, and taking hold of it, it proved to be a ♂ and ♀ in copulation of a species of *Acridiinae* *exactly* mimicking in color the stems of the *Larrea*. This was particularly interesting, as we have already *Booettia argentatus* confined to the *Larrea* (Bruner gives the food plant wrong) and exactly resembling the foliage; and now here is a species like the stems."

I have introduced into my description the notes on the color of the living insect given me by Mr. Cockerell in a brief description of the species, and have adopted his specific name.

NEW SPECIES OF LEPIDOPTERA.

BY GEO. D. HULST.

GEOMETRIDÆ.

Tephroclystis insolabilis, sp. nov.

Palpi long, heavily haired, drooping, blackish or fuscous gray; front tufted, sordid fuscous gray; fore wings long, rather narrow, of a soft, even fuscous gray, the lines slightly marked along costa, very faint across the wing; hind wings same color as fore wings, with faint indications of lines on inner margin; marginal lines on all wings blackish; no discal spots; the hind wings are short, wavy on outer margin, the anal angle quite prominent. Expands 20-22 mm.

Arizona.

Tephroclystis flebilis, sp. nov.

Palpi front and antennæ dark fuscous; thorax fuscous in front, fuscous gray behind; abdomen gray, laterally almost white; fore wings narrow, elongated, fuscous darker, almost blackish along costa, and more broadly along outer margin filling marginal field, the black of the costa broken as showing the beginning of cross lines, and broadened into a subquadrate spot within outer line, the blackish broken by whitish scales; basal line scarcely evident; outer line broad, indeterminate, whitish; an outer scalloped dentate white line on outer field parallel with margin; hind wings rather small, rounded, fuscous, the beginnings of lines showing along inner margin; marginal lines on all wings black, more or less broken; beneath much as above, but with a broad, rounded line on hind wings. Expands 24 mm.

Sitka, Alaska, from the Harriman Expedition. Collected by T. Kincaid, June 16. The National Museum type number is 4920.

Cysteophora, gen. nov.

Palpi small; front slightly rounded; antennæ of ♂ heavy, dentate pubescent; thorax and abdomen smooth; fore wings elongate, outer margin rounded, inner margin short, the number of veins uncertain, probably 11; hind wings very small, the venation much distorted, S with cell about one-half its length, the wing folded together behind cell, and raised on the upper portion into a bladder or pouch, with a deep notch on outer edge of wing; fore and middle legs normal; hind legs very slight, and rather short, tibiæ scarcely stouter than the tarsi and all spurs wanting.

The genus is a peculiar one among its congeners in lacking the spurs on the hind tibiæ, and in a tendency as in some of the Sterrhinæ and Geometrinæ towards obsolescence of the leg itself; the pouch on the hind wings is also peculiar.

Cysteophora perversipennis, sp. nov.

Palpi ochre fuscous; front fuscous; summit whitish ochre; antennæ ochre;

thorax ochre, with fuscous tinge; fore wings light ochre, with a slight fuscous tinge; basal line broken blackish, not distinct, rounded from costa to cell, then straight to inner margin; outer line irregular, wavy dentate, rounded in its general direction; outer space more fuscous, broadest towards apex; hind wings ochre whitish, a broken fine extra-discal cross line evident; outer space broken fuscous; discal spots on fore wings, indistinct black; beneath much as above, without so much difference in color between outer space and rest of wings. Expands 11 mm.

Palm Beach, Fla. Taken by Dr. Dyar in March or April. The National Museum type number is 4921.

Mesoleuca niveifasciata, sp. nov.

Of the size and shape of *M. vasaliata* Guen., and with the lines of that species though these are not definite in view of the much darker ground color of the wings; across the middle of the wing is a cream white cross band, somewhat irregular on its borders, more so on the outside than inside, but of nearly the same width across the wing; hind wings as in *M. vasaliata*; beneath even fuscous, a little darker near apex of fore wings, and with a faint extra-discal blackish cross line on hind wings.

Rhinebeck and Mt. Vernon, N. Y. The National Museum type number is 4924.

Wauchula, gen. nov.

♂; palpi porrect, slender, rather short; front flat; antennæ dentate pubescent, rather heavy; thorax and abdomen untufted; fore wings 12 veins, 3 and 4 separate, 5 nearer 6 than 4, 6 from cell, 7, 8 and 9 stemmed, 2 accessory cells; hind wings 8 veins, Sternid-like, 5 nearer 6 than 4, 3 and 4 separate; fore and middle legs normal; hind legs, tarsi and tibiae entirely aborted, coxa with a large heavy tuft of hairs, fastened at lower end and loosened above, thus radiating and spreading; a very prominent projection downward on each side of first segment of abdomen, fully as long as width of abdomen.

Close to *Xystrota* Hulst, differing in the ♂ in antennal structure, and in the structure of the hind legs. The ♀ I have not seen.

Wauchula rubrotincta, sp. nov.

Palpi ochre reddish, deep red at tip; front and summit deep bright violet red; thorax yellowish red in front, deep purple red behind; abdomen deep red above, yellow on sides, ochre below; fore wings yellowish red, the base deepest in color, the space beyond middle and the apex lightest, the lighter extra-discal space forming a faint band with something more of a yellowish cast, more deeply violet purple along margin; hind wings corresponding in colors to fore wings; on all wings there are many scattered raised scales giving a squamous appearance; beneath bright pinkish purple, nearly uniform, the base of hind wings however and the posterior half of base of fore wings being bright yellow. Expands 19 mm.

Palm Beach, southern Florida. Taken by Dr. Dyar in March or April. The National Museum type number is 4922.

The insect has superficially somewhat the appearance of some of the darker specimens of *Nystrota hepaticaria* Guen.

Eois suavata, sp. nov.

Palpi bright whitish red in front; front purple red, somewhat ochreous below; summit dull white to reddish; antennæ whitish to red above, basally dull red, beyond ochreous below; wings whitish, considerably mixed with granite gray scales giving the whole a shaded blue white color; costa at base dull reddish, slightly tinged with reddish beyond; three cross lines, quite indistinct, the basal sometimes obsolete, when present, with the outer, fine, wavy; the middle broader and slightly darker, slightly bent wavy, the largest bend being just below cell; fringes reddish basally whitish outwardly; hind wings corresponding to fore wings, basal line wanting, the middle and outer about as distinct as on fore wing, the outer wavy, bent, the middle bent strongly on cell, then nearly straight to margin; discal spot distinct on hind wing, black, with generally some reddish scales; beneath smooth whitish, fore wings heavily stained with wine red, the red tinging more or less of anterior part of wing, an outer row of venular red spots, and marginal line red or blackish; fringes reddish; hind wings with corresponding row of spots, sometimes very faint; margin and fringes reddish or blackish. Thorax and abdomen white, with scattered granite colored scales. Expands 24-26 mm.

Palm Beach, southern Florida. Collected by Dr. Dyar in March or April. Dr. Dyar has raised the larva. Type number in National Museum is 4964.

Eois microptera, sp. nov.

Palpi fuscous; front blackish fuscous; fore wings light clay ochre fuscous, with a few scattered black scales; basal line faintly marked with black scales, broken, very irregular in outline; outer line black, fine, quite distinct, irregular, rounded out in a large sinus below costa to vein 6, returning in there to black discal spot, then in a straight line out, forming at end a double tooth, one on vein 5, the other on vein 4, then returning, and again forming a shorter tooth on vein 3, then a long return nearly to basal line, then to inner margin with teeth on veins. A marginal row of distinct black spots at end of veins; hind wings color of fore wings with an extra-discal blackish cross line, very irregularly angulate on veins; a marginal row of black spots at end of veins; discal spots on all wings distinct, black, touched by inner tooth of cross line; beneath lighter and more ochreous than above, the lines very faintly if at all showing. All the wings are broad and rounded. Expands 12 mm.

Hastings, Fla. Taken in May. The generic reference is provisional.

Deilinia solamata, sp. nov.

Palpi ochre fuscous, fuscous blackish on end; front fuscous; thorax in front sordid ochre fuscous, behind sooty blackish; abdomen sooty black with some lighter scales, especially on anterior segment and posteriorly on outer segments; all wings even sooty blackish without any spots or lines evident; beneath nearly the same color, legs, thorax and abdomen ochre fuscous. Expands 27 mm.

Winnipeg, Manitoba. From Mr. Hanham, who says it was "taken on the prairie flying in the sun." It approaches *D. borealis* Hulst pretty closely, and may be a variety of that species. All I have seen of *D. borealis*, however, are very much lighter in color.

Eugonobapta brunneolineata, sp. nov.

Palpi ochre, tipped with fuscous; front ochre fuscous; antennæ yellowish; thorax and abdomen clay ochre; fore wings light whitish ochre, with a yellowish stain basally and along inner margin; cross lines brown line distinct; the basal rounded below costa, then nearly straight to inner margin, the outer nearly parallel with outer margin, and with a dull angle at vein 3; hind wings of same color as fore wings with a single distinct brown line continued from the outer line of fore wings, slightly bent at middle; beneath very nearly the same color as above, the lines evident but faint. Expands 24-25 mm.

Hastings, Fla. Taken in May.

Orthofidonia elsinora, sp. nov.

Palpi and front blackish; summit of head whitish; thorax whitish gray; abdomen whitish gray, slightly stained with fuscous ochre, and peppered with scattered black scales; fore wings bluish-gray, peppered with evenly scattered but infrequent black scales; basal line well out, showing in a distinct lengthened black costal spot, then faint across the wing, a little more distinct at inner margin, forming a right angle on cell, then nearly straight; outer line somewhat more distinct, black at costa, but not so heavy as basal line, a little heavier on inner margin, and subparallel with outer margin; outer space shaded with smoky black from below apex to inner angle, reaching almost or quite to outer line; a marginal row of intervenular black points; hind wings less bluish, more smooth than fore wings, with a very faint, rounded median line; a marginal row of black spots; beneath more fuscous stained, less bluish, the wings sparingly peppered with black scales, the outer line distinct on both wings, and emphasized on veins. Expands 26 mm.

Elsinore, Cal., March 28th. I have the ♀ only. It apparently is closely allied to *O. semiclarata* Walk.

Cymatophora virginalis, sp. nov.

Palpi and front light ochre fuscous; antennæ yellowish fuscous; front thorax and abdomen pure white; wings pure white, the fore wings a little fuscous stained basally along costa, and with a few dark scales at base; discal spots very faint; beneath as above. Expands 22 mm.

Newark, N. J. Webster, N. H.

Cymatophora deleta, sp. nov.

Palpi fuscous gray; front fuscous ochre; thorax fuscous gray; abdomen darker; fore wings fuscous gray, thickly peppered with dark fuscous scales giving an even dark fuscous gray appearance; costa blackish fuscous; basal line obsolete; outer line faintly indicated in darker shadings near costa, at middle, and at inner

margin; a faint indeterminate whitish band in outer field, parallel with margin, more distinct towards costa; marginal line broad, black; fringe checked with dark and light fuscous; hind wings even fuscous, discal spot faint, no cross lines, marginal line black; beneath lighter on fore wings; about the same color on hind wings; fore wings even in color; discal spot quite distinct; hind wings with outer space more grayish than the rest of wing; discal spots quite distinct. Expands 24 mm.

Webster, N. H. From Mr. Chas. E. Goodhue. I have the ♀ only.

***Alcis guttata*, sp. nov.**

Palpi and front blackish fuscous; thorax and abdomen blackish fuscous with an ochre tinge; fore wings blackish fuscous, intermixed with whitish, the whitish showing in several very indeterminate cross lines; basal line blackish, rounded below costa, not very distinct; outer line blackish, bent beyond discal point, from there curved to inner margin, not distinct, most emphasized on veins or more distinct and then dentate on veins; a submarginal white line most distinct in a round white spot between veins 6 and 7, and in a lunule near anal angle; hind wings corresponding to fore wings, the cross line sometimes distinct, dentate; edge of wing wavy; discal spots on all wings; beneath even fuscous, the outer lines showing on all wings generally by black points on veins only. Expands 32-34 mm.

New York; Pennsylvania. An insect very much resembling *Homochlodes* (*Lozogramma*) *disconventa* Walk., in size and general appearance.

***Selidosema homopteroides*, sp. nov.**

Palpi and front blackish; thorax, abdomen and all wings, dark blackish gray, quite even; fore wings pointed, broad, outer margin rounded, slightly wavy; basal line black, well out on costa, wavy sinuous, reaching inner margin one-half as far out as on costa; outer line jet black, starting a little within apex at costa, and ending at middle of inner margin with a strong outward bend just above middle; the line has inwardly a parallel black line, very distinct on lower half, gradually fading away from middle towards costa; marginal line jet black; hind wings with extra-discal jet black cross line, rounded, bent outward below anterior edge and at middle, this with a rather faint inward subparallel black line; marginal line black; outer margin of wing wavy dentate; beneath blackish, the lines much more faint than above. Expands 31 mm.

Gold Hill, Ore. C. R. Biederman. The National Museum type number is 4925.

***Phigalia denticulata*, sp. nov.**

Of the size and general appearance of *P. olivacearia* Morr. It lacks the silkiness and olive shadings of that species; the lines are much more distinct, the basal rounded with two not always distinct teeth outwardly; the middle line somewhat rounded with two teeth inwardly on subcostal and median veins; the outer line just beyond cell somewhat sinuate, scalloped denticulate, the denticulations on veins are

very pronounced; a faint submarginal denticulate blackish line parallel with margin; hind wings with extra-discal line quite distinct, toothed outwardly on veins, and a submarginal shading showing most distinctly at anal margin; beneath even light fuscous without lines; discal spots distinct.

Central Texas. Without doubt very near to *P. olivaccaria*, but very distinct in appearance.

Plagodis kempii, sp. nov.

Palpi orange ochre; front and thorax ochre gray; abdomen nearly the same color, but more ochreous; fore wings dull whitish, somewhat ochre tinted especially on outer space and above anal angle, the whole wing peppered with loosely scattered brown scales, these becoming thicker outwardly with a tendency to striation; cross lines two, blackish brown; basal nearly straight, fine; the outer heavy, broad, even, nearly straight, slightly bent out at middle; costa beyond this line and the fringes maroon brown; hind wings whitish tinged with yellow, showing more clearly on middle of outer space; cross line maroon brown, fine, obsolete on front half of wing; marginal line brown; fringes maroon tinged; discal spots prominent on fore wings, wanting on hind wings; beneath all wings quite yellow; cross lines fainter; all lines, pepperings, striations, and fringes, of a pink or purple color. Expands 32 mm.

Beaver Co., Pa. From Mr. S. T. Kemp, in whose honor I name the insect, which is very strongly marked and very pretty.

Euchlæna abnormalis, sp. nov.

Palpi ochre, smoky black at tip; front dull black; summit buff ochre; antennæ-stem buff ochre above, pectinations dull black; collar ochre; thorax blackish, with patagial ochre; abdomen ochre, blackish interlined on segments and blackish laterally; wings dull smoky black, the veins buff ochre, this color more distinct beyond cell, becoming lost on outer field; on fore wings a rounded rather faint basal cross line; on all wings an outer buff ochre cross line, very distinct, rather broad, nearly straight on fore wings, a little rounded on hind wings; fringes blackish, a little ochreous at end of veins; beneath very nearly as above. Expands 41 mm.

Winnipeg, Manitoba. June 26th. From Mr. Hanham.

Tetracis hyperborea, sp. nov.

Palpi bright ochre yellow; front ochre; summit and front of thorax more yellowish; thorax and abdomen rather light ochre, the latter somewhat fuscous stained; all wings light ochre, more or less fuscous tinged; fore wings with basal line showing in three blackish spots, the first and larger costal, the second at middle, the third on vein 1; just beyond discal point which is very faint, is a broad blackish shading running nearly straight across wing; outer line of black points on veins, these diffuse on edges; the line is parallel with outer margin to vein 2, then curved a little outwardly; a line of faint diffuse marginal points; hind wings with outer line of black dots on veins, discal spots present, blackish; beneath as above on fore wings, the basal half more fuscous, discal spots more distinct, middle band much less marked; outer band distinct, the spots confluent; hind wings, discal spots very distinct, black; outer line of spots more distinct than above. Expands 42 mm.

Virgin Bay, Alaska. Harriman's expedition, T. Kincaid collector. June 25th. The National Museum type number is 4119.

EPIPASCHINÆ.

Jocara (Toripalpus) dentilineella, sp. nov.

Palpi whitish, end blackish, front fuscous; summit smoky white; antennæ fuscous; collar dirty white; thorax mixed black and smoky white, sometimes violet shaded; abdomen, first segment whitish or fuscous gray, the rest blackish or dark fuscous with posterior part of each segment much lighter; fore wings blackish or blackish gray, the middle field and marginal space considerably the darker, with a slight rounded rather large ochre spot within basal line next to posterior margin; lines black, basal rounded, somewhat wavy or even; outer line black, distinct, angled outwardly at veins 4 and 5, the line running out in black teeth on each of the veins; a light gray shade beyond the outer line; marginal line of intervenular triangular black spots; fringe broken, gray and black, interlined, sometimes forming thus a row of whitish spots; hind wings light fuscous, veins and outer space darker; fringe white or whitish, brokenly interlined with dark fuscous; beneath fuscous, the outer line on fore wings showing in a whitish space more distinct at costa. Expands 24-25 mm.

Catalina Springs, Ariz. Taken by E. A. Schwarz, April 4th to April 22d. The specimens are all females. The National Museum type number is 5182.

Benta floridella, sp. nov.

Tongue reddish in front; palpi slender, blackish, mixed with whitish, becoming whitish in front on middle segment; front violet reddish; thorax violet, in front violet reddish; thorax violet in front, becoming more gray behind, especially on patagiæ; abdomen fuscous ochre, darkest on anterior portion of segments; fore wings blackish gray to basal line, heavily tinged especially posteriorly with violet, with two or three black spots near middle of field; basal line black, distinct, rather oblique, straight in its general direction, but slightly wavy dentate, sometimes distinctly geminate with whitish line between; middle field generally lighter than basal field, often whitish toward basal line, scale ridge not prominent, the whole field tinged with violet; outer line black, distinct, bent outward at middle and at vein 1, somewhat dentate outwardly on veins, edged outwardly with whitish; outer field reddish brown, especially apically, much broken with whitish; marginal lines black, broken, fringes reddish fuscous, interlined; hind wings nearly pure white on basal and middle portion, becoming blackish fuscous outwardly, thus showing especially at anterior angle and on veins and fading away towards anal angle; a faint outer shading indicates a cross line; marginal line black, rather heavy. Beneath blackish fuscous, outer line evident, diffuse, purplish along costa, veins black on outer field; hind wings nearly as above. Expands 20-23 mm.

Palm Beach, southern Fla. Dr. H. G. Dyar, who raised the larvae. The National Museum type number is 4965.

In some specimens the purple and reddish tints are nearly or entirely lost: the males seem more especially to have this characteristic coloring.

Benta speciosella, sp. nov.

Very much like *B. floridella*; the violet shadings are wanting, the basal half of the basal field is gray, or whitish on anterior half, blackish posteriorly and outwardly, the scale ridge forms a black line across wing; basal line more bent in middle; outer line scarcely dentate; there are three lengthened black spots on veins in marginal field near apex; hind wings less clear than *B. floridella*, veins fuscous shaded; outer edge, especially near apex, fuscous; beneath lighter.

Santa Rita Mountains, Arizona. Collected by E. A. Schwarz, June 15th. The National Museum type number is 4966.

PHYCITINÆ.

Sarasota, gen. nov.

Tongue strong; labial palpi erect, rather long, exceeding summit, end member quite long; maxillary palpi small in ♂; front rounded; antennæ of ♂ filiform, not bent above base, without scale tuft, finely pubescent. Fore wings 11 veins, 3 separate, 4 and 5 from a point, 10 from cell; hind wings 8 veins, cell short; 2 and 3 long, parallel; 3 and 4 stemmed one-half length, 7 and 8 stemmed; middle legs with tibiae long and heavy; femora long and heavy with a long pencil of hairs from upper end; hind legs more than ordinarily weak, indeed partly aborted.

Peculiar in the structure of middle and hind legs of ♂. It may be catalogued after *Myelois*.

Sarasota plumigerella, sp. nov.

Palpi blackish; summit of second member ochre fuscous; front blackish; summit dull black; thorax blackish, tinged with wine red, this color prevailing in front; abdomen ochre, tinged with fuscous on dorsum; fore wings blackish, tinged with wine red, more distinct along costa and on posterior half; the posterior portion is somewhat lighter than anterior portion, the lighter color showing especially on veins; fringes wine red; basal line rather distinct, extending from costa one-half across wing; outer line very indistinct; marginal row of black spots; hind-wings white, the veins lined with fuscous; margin fuscous; beneath even shining fuscous; fore wings ochreous along costa and at base; legs reddish. Expands 14 mm.

Palm Beach, southern Florida. Taken by Dr. H. G. Dyar. The National Museum type number is 4927.

Heterographis arizonella, sp. nov.

Palpi blackish gray; front light gray; summit nearly white; thorax blackish gray; abdomen fuscous, with an ochre tint; fore wings pure white, pretty evenly peppered with black scales giving an even clear gray color; base black; lines white, edged on both sides with black; the basal much bent out in the middle, the general

direction being much as the line of an interrogation mark; outer line oblique, with an angle at vein 5, otherwise straight; the black edging heaviest outwardly at costa; a black cross line at middle, beginning at and including discal spots, faintly extending to inner margin; hind wings light transparent fuscous, darker on veins and margins. Expands 20-22 mm.

Catalina Springs, Ariz. Collected by E. A. Schwarz, April 15th. The National Museum type number is 4928.

Honora dulciella, sp. nov.

Palpi gray; front ochre fuscous; thorax gray; abdomen smoky gray; fore wings white on anterior half, at middle dark fuscous, on posterior portion ochre fuscous; the anterior part is brokenly but quite thickly peppered with brick red scales; basal line obsolete; outer line almost so, showing in a shading of red on anterior portion, and on posterior portion a little darker fuscous; hind wings light smoky, the veins and margins darker. Expands 14 mm.

Palm Beach, southern Florida. Dr. H. G. Dyar. The National Museum type number is 4926.

Honora cinereella, sp. nov.

Palpi ascending, rounded, end member longer than second, light gray in color; front and collar whitish; thorax gray; abdomen gray on first two segments, then fuscous gray; wings even gray, a little lighter at middle of space between veins, the veins themselves narrowly black; basal line whitish, broad rounded, faintly edged with black outwardly; outer line whitish, faint; a marginal row of black spots; hind wings pellucid fuscous white; margin a little waved; marginal line black; beneath fuscous gray, the gray clearer along costa; hind wings as above. Expands 32 mm.

Santa Rita Mountains, Arizona. Taken by E. A. Schwarz, June 10th. The National Museum type number is 5184.

The insect has very much the appearance of *Melitara fernaldella* Hulst, and is hardly a typical *Honora*. The description is from the ♀ only.

Honora luteella, sp. nov.

Palpi ascending, rather long, quite slender, exceeding head, end member quite long, color ochre, tips fuscous; head and thorax ochre; abdomen ochre, posterior part of segments fuscous; antennæ dark fuscous; fore wings ochre, white on costa to subcostal vein reaching from base to apex, and more faintly on median vein and vein 1, there broadened basally; otherwise the wings are yellow ochre, without lines; discal spot small, faint; fringes ochre yellow, faintly interlined near base with a fuscous tint; hind wings light fuscous, deeper fuscous along margins and on veins; fringes as on fore wings; below, fore wings light fuscous ochre; hind wings as above. Expands 30 mm.

Santa Rita Mountains, Arizona. Taken by E. A. Schwarz, June

10th. I have the ♀ only. The National Museum type number is 5183.

***Ephesiodes nigrella*, sp. nov.**

Palpi and front blackish fuscous; thorax fuscous gray; abdomen blackish fuscous, the last two segments becoming orange ochre; fore wings blackish fuscous gray; basal line white, rather broad, straight, edged outwardly and rather heavily with black; discal spots superimposed, faint; outer line very faint; hind wings thin translucent fuscous, veins and margins darker. Expands 15 mm.

Los Angeles, Cal. April. Taken by Dr. L. O. Howard.

***Aurora nigromaculella*, sp. nov.**

Palpi long, beak-like, light smoky gray; front and thorax fuscous white; abdomen fuscous white; fore wings whitish on anterior half to below discal point, then the color gradually narrowing to costa near beginning of outer line; posterior half ochre stained at base half way to basal line, then gray; beyond basal line at middle of wing a quite large quadrate black spot, behind this russet ochre to margin; beyond this the wing posteriorly ochre stained nearly to outer line; beyond outer line gray; basal line white, even, somewhat bent; outer line white, irregularly wavy dentate, the dentations being on veins; the line is outwardly at costa and inwardly at cell edged with black, then shaded with fuscous on both sides; a marginal row of black spots; hind wings translucent shining white, shaded with yellow and fuscous; beneath fore wings fuscous, darker at apex; hind wings as above. Expands 18 mm.

Santa Rita Mountains, Arizona. Taken by E. A. Schwarz, June 8th. The National Museum type number is 5185.

CRAMBIDÆ.

***Eufernaldia*, gen. nov.**

Labial palpi long, somewhat drooping; maxillary palpi prominent, scarcely triangularly scaled; tongue obsolete or nearly so; front with a prominent pointed cone tubercle; antennæ of ♀ filiform; forewings 11 veins, 3 wanting, 7, 8 and 9 on a stem, 10 and 11 from cell; hind wings 8 veins, cell closed, though the cross vein is not heavy, lower angle of cell strongly produced, vein 2 distant from angle, 3 and 4 at angle from a point, 4 and 5 stemmed one half their length, 6 and 7 from upper angle, 8 stemmed with 7 one-half its length; legs long and slender; all spurs present.

Peculiar, especially in wanting vein 3 of fore wings.

***Eufernaldia argenteonervella*, sp. nov.**

Labial palpi rather long, slender, hairs long below on third segment, fuscous ochre; front fuscous ochre; summit pure white; fore wings light ochre, the costa narrowly, the veins of cell and also all other veins except 9, 10, 11 and 12, broadly lined with metallic silvery white; the ochre portion along these silvery lines narrowly and somewhat indistinctly edged with blackish scales, as is also the outer margin; fringes pure metallic white, twice faintly interlined with blackish scales; hind wings

shining silvery white, translucent; beneath, colors above reproduced, but not so marked and wanting the metallic luster. Expands 30 mm.

Santa Rita Mountains, Arizona. Taken by E. A. Schwarz, June 13th.

***Eromene virescens*, sp. nov.**

Labial palpi, white, somewhat greenish brown on sides; maxillary palpi prominent, pure white; front white; thorax dull white; abdomen whitish, ochre tinted above; fore wing mouse color, washed with dull green, costa slightly grayish; a broad white stripe at middle of wing reaching from base to above middle of outer border, slightly concave above; inner margin also with a broad white stripe reaching quite a little up the outer edge; a rather faint blackish marginal line; fringes long, slightly more gray than wing; hind wings rounded at anal angle, somewhat sinuous on outer edge, whitish with a fuscous stain, becoming dark fuscous outwardly, this more broad and prominent at anterior angle. Expands 17 mm.

Arizona. The National Museum type number is 5186.

The insect is not exactly congeneric with *Eromene*; the labial palpi are very much shorter, the wing is of a different shape, and the markings are of a very different type—in this latter respect unique among American *Pyralidina*.

NEW SPECIES OF HETEROCERA FROM TROPICAL AMERICA.

BY WILLIAM SCHAUS.

Fam. CERATOCAMPIDÆ.

***Othorene curvilinea*, sp. nov.**

Male. Dark ochreous, tinged with lilacine on the outer margin of primaries, which are crossed by a fine dark reddish brown line from costa, near apex, to middle of inner margin, where the line curves up to near costa; a slight transverse streak at end of cell; the secondaries are crossed by a faint reddish line. Underneath duller; the outer margin of primaries and costal margin of secondaries lilacine; a reddish discal spot in primaries, and the line not reaching inner margin.

Female. The inner portion of the line is more oblique and parallel to outer portion; the secondaries are tinged with red. Expanse ♂ 68 mm., ♀ 91 mm.

Habitat: Colombia, Coatepec, Mexico. Allied to *Othorene jason* Bdv.

***Othorene cinerea*, sp. nov.**

Male. Primaries rather long and narrow, the inner margin rounded. Secondaries prolonged at anal angle. Primaries gray; the space between the lines brown-

ish gray; the lines wavy, broad, darker than the median space; the inner line perpendicular; the outer line from costa near apex to inner margin near the angle, a large white spot at the end of the cell. Secondaries with the outer margin and anal angle gray; the costal margin brown; the inner margin nearly black. Underneath dark gray with a broad blackish outer transverse shade on both wings. Abdomen golden brown with paler transverse bands. Expanse 54 mm.

Habitat: Rio Janeiro.

Othorene lilacina, sp. nov.

Male. Body above yellow; the patagia lilacine; dark transverse bands on abdomen. Body below lilacine; the legs red. Wings lilacine. Primaries, the costa, lines and a shade on outer margin, between veins 3 and 5, darker; the inner line nearly straight; the outer line lunular from costa near apex to middle of inner margin. Secondaries with the costal margin broadly suffused with brown; an outer dark line, nearly straight. Expanse 64 mm.

Habitat: Colombia.

Othorene irrorta, sp. nov.

Male light reddish brown, slightly irrorated with lilacine; the base narrowly the outer margin beyond the line, and a large round discal spot lilacine; the inner line indistinct, very close to base; the outer line fine, violaceous from apex, slightly curved, to inner margin at two-thirds from base. Secondaries roseate; the costa and outer margin tinged with light brown. Underneath primaries roseate at base and in disc; costal margin yellowish brown; outer margin lilacine; the outer line red; a large black discal spot. Secondaries very pale pink; the costal margin to line light yellowish brown.

Female. Primaries brown, more thickly covered with black and lilacine striae; the inner line fine, curved, indistinct; discal spot hardly visible; outer line, fine, dark, straighter than in the male. Secondaries as in the male. Underneath brownish; the base of primaries slightly roseate; a very large black discal spot; inner margin of secondaries broadly pinkish white. Expanse ♂ 58 mm., ♀ 79 mm.

Habitat: Jalapa, Orizaba, Mexico.

Othorene verana, sp. nov.

Body and wings reddish or ochreous brown. The lines violaceous; the inner line somewhat curved, broadly shaded inwardly with lilacine; the outer line straight from apex to middle of inner margin, outwardly shaded with lilacine; the outer margin towards apex similarly shaded; the discal spot white, sometimes surmounted by another minute spot. Secondaries with some reddish scales along inner margin; an indistinct transverse median shade. Expanse ♀ 84 mm.

Habitat: Jalapa, Mexico. This is the *O. cadmus* H. S. of the Biologia.

Adelocephala pamala, sp. nov.

Body yellow above, white below; patagia violaceous; front of legs reddish.

Primaries; base and outer margin violaceous; median space yellow on inner margin, and on costa towards apex, also some yellow streaks on inner side of outer line, otherwise median space is violaceous; a white discal spot broadly surrounded with violaceous; the outer line from apex to inner margin near angle. Secondaries pale yellow; slightly tinged with reddish on inner margin. Underneath pale yellow; the costa and outer margin of primaries violaceous. Expanse 35 mm.

Habitat: Castro, Parana.

Adelocephala totoma, sp. nov.

Male. Head and thorax pinkish gray. Abdomen blackish above, gray underneath. Primaries: the base narrowly, and outer margin beyond the outer line, pinkish gray, the intermediate space brown, with some dark gray strice; the outer line dark gray from costa near apex to middle of inner margin; a white spot in the cell; the outer and inner margin with dark gray fringe. Secondaries roseate, the outer margin whitish. Underneath primaries roseate; the costa and apex grayish; the line only visible at apex. Secondaries grayish white. Expanse 59 mm.

Female. Primaries light grayish brown with darker strice. Secondaries pale roseate, with outer margin grayish brown. Underneath entirely pale grayish brown without markings. Expanse 65 mm.

Habitat: Castro, Parana.

Hylesia subaurea, sp. nov.

Female. Head and thorax reddish brown. Abdomen black above, golden yellow below. Wings violaceous red, the lines darker. Primaries: the inner line broad near the discal spot which is large and also darker; the outer line slightly oblique to vein 3, then straight to inner margin, preceded by a paler shade; the outer margin paler except between veins 3-6, the paler portion limited by a subterminal, irregular line. Secondaries; the discal spot less distinct; the inner margin clothed with golden hairs; the outer line broad; a subterminal lunular line, leaving the outer margin paler. Underneath the base of the secondaries covered with golden hairs; the outer and subterminal lines close together at apex, then diverging to above anal angle. Expanse 60 mm.

Habitat: Orizaba, Mexico.

Hylesia corevia, sp. nov.

Male. Head, patagiae, and abdomen light ochreous brown; thorax dark velvety brown. Primaries ochreous brown tinged with grayish buff on costa; the lines fine, dark brown; the inner line irregular; the outer line rounded below costa then parallel with outer margin; discal spot large, greenish buff; an indistinct subterminal shade; a dark marginal space below apex. Secondaries violaceous; the costal margin broadly grayish; the outer margin broadly ochreous brown; an outer and a subterminal violaceous line, the latter more wavy; discal spot large, orange red with a whitish center. Underneath primaries gray; in the cell and below apex on costal margin dark violaceous brown; a large bright red discal spot. Secondaries violaceous gray, reddish brown on outer margin; a fine darker outer line; discal spot red with yellowish center.

Female. Head and patagiae violaceous, thorax brownish. Abdomen light brown. Primaries violaceous, darkest at the base and on outer margin; the lines as in male, but heavier; discal spot very large, violaceous brown; the subterminal dark line followed by a paler shade; the outer line below vein 6 followed by a less distinct line. Secondaries violaceous gray; a fine dark outer line and an irregular subterminal shade; the discal spot large, round, dark gray, with paler center containing a minute reddish point. Expanse ♂ 57 mm., ♀ 76 mm.

Habitat: Rio Janeiro.

***Automeris obscura*, sp. nov.**

Male. Primaries with the apex obtuse, the outer margin sinuate, dark violaceous brown; the costal margin almost black; some golden hairs on inner margin; inner line wavy, black; a large black discal spot; outer line black, straight, inwardly oblique from costal margin. Secondaries brownish black; a black outer line, evenly curved; a faint dark spot beyond the cell, crossed by an indistinct whitish line. Underneath the primaries are whitish beyond the cell; the discal spot and outer line very distinct; a faint subterminal line. The secondaries below are lilacine gray; the spot beyond cell very minute; an outer dark line, and broader subterminal shade. The body above is dark mingled with golden brown hairs, below golden brown. The ♀ is paler and more thinly scaled with the markings less distinct, the underside the same as the upper. The outer margin of primaries straight. Expanse ♂ 66 mm., ♀ 70 mm.

Habitat: Blumenau, Brazil.

***Automeris postalbida*, sp. nov.**

Head and thorax dark brown. Abdomen ochreous brown with dark transverse lines. Primaries violaceous brown, darkest at base and beyond the outer line; the inner line dark, wavy, inwardly shaded with light brown; discal spot small, indistinct, surrounded below and outwardly by five velvety black spots, partly edged with light brown scales; outer line straight, dark brown, inwardly shaded with lilacine; the veins beyond the outer line brown; a subterminal wavy dark shade. Secondaries white; a large cluster of reddish ochre scales at base and basal half of inner margin; the ocellus large, dark grayish brown, containing a black spot crossed by a white line, and broadly circled with black; an outer curved black line; a broad blackish brown subterminal band, beyond which the outer margin is brown thickly mottled with gray and lilacine scales. Underneath the primaries are roseate; a very large discal spot, black, containing a brown center and white dot. Secondaries brown with a small white discal spot; the lines indistinct. Expanse 113 mm.

Habitat: Balzapamba. Allied to *A. larra* Walk.

***Automeris flammans*, sp. nov.**

Body light roseate. Primaries dark roseate, crossed by a yellow line from middle of inner margin to costa near apex; discal spot indistinct. Secondaries smoky gray; the costal and outer margins pale roseate; the extreme outer margin and fringe pale brown; a black wavy outer line; the ocellus black containing some reddish brown

scales and a white mark, and circled with deep yellow. Underneath roseate, the inner margin of secondaries paler. Expanse ♀ 102 mm.

Habitat: Colombia.

Automeris amanda, sp. nov.

Head and thorax dark velvety brown. Abdomen light reddish brown with darker transverse lines. Primaries violaceous brown; the lines fine, darker; the inner line oblique from costa to median vein, then inwardly curved and outwardly curved on submedian; discal spot large, indistinct, marked on veins by dark velvety points; outer line nearly straight. Secondaries reddish fawn color; the ocellus large, pale brown, containing a black ovate spot which is faintly outlined and crossed by a white line, and is also circled with black; outer margin violaceous brown; an outer and subterminal brown line. Underneath the primaries are pale reddish brown; the discal spot large, dark brown, circled with black, and containing a white spot; an outer dark line and subterminal shade. Secondaries dark brown, irrorated with gray scales; a white discal point; indistinct median and outer dark lines. Expanse 86 mm.

Habitat: Bolivia.

Fam. MEGALOPYGIDÆ.

Mesoscia pascora, sp. nov.

Head brown. Collar pinkish white. Thorax dark gray; a white spot posteriorly. Abdomen dark gray. Primaries white; at the base a black spot surmounted by pinkish scales; costa black at base; a dark gray band from inner margin where it is broad, and narrowing towards apex, broken by the whitish veins; a terminal row of gray spots not reaching apex. Secondaries whitish; inner margin gray; a gray shade from inner margin to costa near apex; a terminal row of gray spots; fringe gray at base. Expanse 25 mm.

Habitat: Castro, Parana.

Megalopyge albescens, sp. nov.

Body white with transverse dark gray lines. Primaries white; some dark gray spots at base; an inner transverse row of smoky black spots extending on costa as far as the end of the cell; a narrow gray outer band, partly obsolete and broken by the veins; a subterminal row of large gray spots, partly filled in with white; a terminal row of dark gray spots. Secondaries white; a terminal row of small gray spots. Expanse ♂ 48 mm.

Habitat: Castro, Parana.

Megalopyge amita, sp. nov.

Body yellow. Primaries covered with wavy hairs; dark lilacine gray; the apex and outer margin pale yellow; a large yellow space on the inner margin at base. Secondaries lilacine gray; the outer margin narrowly yellow. Expanse ♀ 36 mm.

Habitat: Castro, Parana.

Megalopyge vulpina, sp. nov.

Frons, legs and body underneath brown. Vertex, thorax and abdomen above ochreous brown. Wings gray; a subterminal whitish line on the primaries; fringe darker. Expanse 36 mm.

Habitat: Castro, Parana.

Sciathos arpi, sp. nov.

Frons brown. Thorax and abdomen ochreous. Primaries dark gray, ochreous at the base; costa, and a line from base below subcostal vein, and joining costa before the apex, yellow; fringe on inner margin and outer margin to near apex yellow. Secondaries, basal half and inner margin ochreous, otherwise dark gray; fringe yellow towards anal angle. Expanse 37 mm.

Habitat: Rio Janeiro.

Norape venata, sp. nov.

Palpi and fore coxae black; vertex yellow; antennae yellow; thorax and abdomen white. Primaries white with fine black lines in the cell and between the veins, there being two lines between the median and submedian veins from base to outer margin. Secondaries white. Underneath the lines on primaries are heavier and dark brown; the costa broadly suffused with brown. Expanse 34 mm.

Habitat: Castro, Parana.

Fam. LIMACODIÆ.

Euclea herbina, sp. nov.

Frons, palpi, legs and abdomen light brown. Vertex, collar and thorax green. Primaries green; the costa, inner margin and base finely brown; the outer margin more broadly so, especially at inner angle and vein 6. Secondaries ochreous; the outer margin light brown. Expanse 22 mm.

Habitat: Espiritu Santo. The brown outer margin is much narrower than in *E. viridiplena* Walk.

Euclea dolita, sp. nov.

Frons, palpi and legs brown. Abdomen pale buff. Vertex, collar and thorax green. Primaries green; costal margin finely light brown; inner and outer margins finely dark brown; base of fringe silvery white, otherwise fawn color. Secondaries fawn color. Expanse 21 mm.

Habitat: Castro, Parana.

Euclea baranda, sp. nov.

Body brown. Wings brown; the primaries with darker brown shadings at the base, beyond the cell and below the median vein, these shadings somewhat iridescent; a dark spot in the cell; a silvery white dentate line below the cell, between the me-

dian and submedian veins; a subterminal row of silvery white spots, chiefly noticeable near the apex. Expanse 25 mm.

Habitat: Colombia. Allied to *Euclea diversa* Druce.

Euclea chiriquensis, sp. nov.

Body very dark brown. Primaries brown; the margins and median vein somewhat violaceous; an interrupted outer row of white spots, the three below the costa being the most conspicuous. Secondaries duller brown. Expanse ♀ 27 mm.

Habitat: Chiriqui. Not having a ♂ of this species I am a little doubtful about its position.

Perola lucia, sp. nov.

Body light brown. Wings grayish brown; some white scales at base and beyond cell; a dark streak in the cell; a subterminal sinuous white line; base of the fringe pale. Expanse 22 mm.

Habitat: St. Lucia, B. W. I.

Natada cochuba, sp. nov.

Body brownish gray. Primaries gray, irrorated with dark brown scales; a dark line from below costa at two-thirds to inner margin at one-third from base; a subterminal straight brown line from costa to inner angle; fringe brown divided by a pale line. Secondaries brownish gray; a terminal dark line. Expanse 32 mm.

Habitat: Castro, Parana.

Sisyrosea aroensis, sp. nov.

Vertex and color yellowish; body otherwise pale roseate brown. Primaries pale pinkish brown with a few scattered dark brown scales; the base of the wings slightly darker, and some indistinct darker transverse shades. Secondaries pale brown. Expanse 17 mm.

Habitat: Aroa, Venezuela.

Fam. EUPTEROTIDÆ.

Carthara surynorta, sp. nov.

♀ dark gray or reddish brown. Primaries with geminate inner and outer lines as in *C. drepanoides* Wlk.; the pale subapical line is evenly curved outwardly from costa and limits a triangular darker space. The secondaries are reddish shaded with gray, and the subterminal line is preceded by a broad darker band. The ♀ is usually reddish brown with the lines as in the ♂. Expanse ♂ 28 mm., ♀ 33 mm.

Habitat: Orizaba, Mexico. Castro, Parana.

Carthara oaxacana, sp. nov.

♀ pale gray with the lines as in *C. surynorta* Sch.; the triangular space not darker, but followed on costa by a pale reddish shade. The subterminal line on secondary is whiter. Expanse 31 mm.

Habitat: Oaxaca, Mexico. Possibly a West Coast race of *C. surynorta*.

***Carthara pamina*, sp. nov.**

♂ pale reddish brown; the lines as in *C. drepanoides* Wlk.; the dark spot beyond the cell connected with costal spot by a dark line. Secondaries reddish mottled with gray and white on inner margin. The ♀ is darker reddish brown; the geminate lines being filled in with a still darker shade. Expanse ♂ 26 mm., ♀ 35 mm.

Habitat: Castro, Parana.

***Carthara orizava*, sp. nov.**

Differs from *C. drepanoides* Wlk. in being gray instead of reddish brown, and is possibly only a variety of that species. Expanse ♂ 35 mm., ♀ 43 mm.

Habitat: Orizaba, Mexico.

***Thelosia meldola*, sp. nov.**

♀ palpi and vertex reddish brown; thorax gray; abdomen above reddish brown with transverse white lines, underneath gray. Primaries: base to inner line, and outer margin light gray, otherwise reddish brown crossed by a whitish outer line; the veins paler on the brown portion of wing; discal spot dark, oval, edged with grayish white; a minute diaphanous spot between veins 5 and 6 on gray marginal space. Secondaries light brown with an indistinct darker geminate outer line. Expanse 30 mm.

Habitat: Castro, Parana.

***Olceclostera bilinea*, sp. nov.**

Head and abdomen brown, collar and thorax grayish. Primaries light brown irrorated with dark brown scales; a median space, fawn color, limited by two dark brown lines, further apart on costal than on inner margin; a faint transparent spot between veins 5 and 6; an outer wavy pale shade. Secondaries dull brown, showing the median and outer dark lines of underside. Expanse 33 mm.

Habitat: Aroa, Venezuela.

***Olceclostera mediana*, sp. nov.**

Body violaceous gray. Primaries: basal half dark reddish brown, outwardly crenulate, and crossed by a broad inner band, irregular, gray mottled with black; some gray scales at base, outer half violaceous gray; a blackish crenulate outer line below vein 4; a brownish subterminal shade; a large and a small transparent subapical spot. Secondaries reddish brown, mottled with gray at anal angle. Expanse 36 mm.

Habitat: Castro, Parana.

***Zanola narda*, sp. nov.**

Antennae white with brown pectinations. Body brown, the abdomen somewhat paler than the thorax. Primaries brown; an inner fine white line angled on costa, then

inwardly oblique towards base of inner margin; a minute dark discal point circled with whitish scales; beyond the cell an oblique reddish brown line from costa to inner margin, followed by a white line slightly curved on costa; this latter line is partly cut and preceded by a fine blackish line; the subterminal line fine, dark brown, partly lunular, and is preceded towards apex by some white scales. Secondaries whitish; the costal and outer margins broadly brown; a small brown discal spot; a median brown shade followed by a fine dark line. Underneath white, the costal margins and apices brown, also the outer margin of secondaries to near anal angle; median and subterminal brown shades, and discal spots; the fringes brown tipped with silvery white. The ♀ has the lines on primaries dark gray instead of white. The secondaries and also both wings underneath are entirely brown. Expanse ♂ 34 mm., ♀ 40 mm.

Habitat: Castro, Parana.

Zanola liliana, sp. nov.

Body fawn color; the patagiae mottled with lilacine scales and fringed with darker hairs. Primaries lilacine mottled with reddish fawn color; the inner line dark velvety brown, preceded by a lilacine shade, slightly sinuous; the discal spot large, pale, containing a dark streak; beyond the cell a reddish brown line, slightly curved; the outer line somewhat curved, fine, black, preceded by a lilacine shade; the subterminal fine, dark brown, deeply lunular; the outer margin reddish fawn color; a terminal brown line. Secondaries brownish; the outer margin yellow; a median and an outer transverse line; a terminal brown line. Underneath the primaries are pale fawn color mottled with brown at apex; a median brownish line. The secondaries are shaded with lilacine; a median dark brown line, angled beyond the cell, and followed by a broad pale brown shade; a brown shade in cell and to apex, the outer line wavy, fine, black; subterminal and terminal brown shadings broken by the veins. Expanse 41 mm.

Habitat: Castro, Parana.

Fam. LASIOCAMPIDÆ.

Hydrias palota, sp. nov.

♂ Palpi, head and thorax gray, mottled with yellow hairs. Body dark gray. Primaries whitish, thinly irrorated with gray scales; the base dark gray; a fine median gray lunular line; a faint subterminal grayish line; no discal spot. Secondaries with the base and inner margin dark gray, the outer portion whitish, thinly irrorated with light gray. ♀ with the irrorations slightly darker. Expanse ♂ 34 mm., ♀ 43 mm.

Habitat: Castro, Parana.

Hydrias pygma, sp. nov.

♂ Body blackish, mottled with brown hairs. Primaries dark brown, the veins nearly black; a basal geminate dark line from costa to median vein, followed in cell and on costa by a whitish space; a dark spot at end of cell; a subterminal, irregular,

whitish line, broadening at apex and inner angle; fringe dark with white spots at ends of the veins. Secondaries dark brown; the costal margin whitish crossed by three brown lines. Expanse 30 mm.

Habitat: Castro, Parana.

Hydrias varona, sp. nov.

♀ Body dull grayish brown. Wings dull grayish brown, the veins slightly olivaceous. Primaries a broad median paler shade on costa, rather indistinct; a subterminal wavy paler shade. Expanse 50 mm.

Habitat: Castro, Parana. Somewhat like the species of *Titya*.

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NEW AMERICAN TINEINA.

By AUGUST BUSCK.

U. S. Department of Agriculture, Washington, D. C.

In the present unsatisfactory state of our knowledge of American Tineina it is of little value (or worse) to describe promiscuously new species from collected material, difficult of subsequent recognition. No one is any the better off because he learns that such and such a new species of *Gelechia* or *Lithocolletis* has been taken in such and such a locality. Only when working up a group, either faunistic, or preferably systematic, does it seem to me excusable at present to describe more species, which are known from the type specimen only. Exceptions may be made in the case of new generic forms or especially striking or otherwise interesting species. I believe anyone will endorse this view who has tried to grope through Chambers' flood of descriptions, many of which represent only valueless names, a dead weight on our lists, and which will not for a long time, if ever again, be connected with the species they represent. But as it will take years before the American Tineina fauna can be worked up systematically by groups, which is the end for which we should strive, it does not seem desirable in the meanwhile to withhold from publication new forms, of which the life history has been ascertained and which are of such interest as to be of some positive gain to our knowledge.

And here I might point out an opportunity for any student, who has not the facilities or the desire to do systematic work, but who still

has time and desire to add truly valuable contributions to science—namely the working out of life histories of these charming little wonders. The opportunity is open to anyone who has eyes to see and leisure time to spare in fields and woods.

I will be glad to determine any bred material sent to me and to assist with any other information on the subject, within my reach.

That there is enough to do for many observers is shown by the fact that of the 1,200 species, described from this country, the life histories of only a small percentage are known, and that in the District of Columbia, where comparatively much collecting has been done, on an average every tenth specimen collected during the last three years represents an undescribed species.

The following are a few species only out of a large collection of bred material on hand, the notes on which I hope from time to time to get in shape for publication.

I am indebted to Dr. Edw. Meyrick, of England, for notes on the new genera, characterized in this paper. I sent him material of these supposed new genera, and he has kindly informed me, that he is not acquainted with any such generic forms from Europe or Australia.

GELECHIIDÆ.

***Polyhymno acaciella*, sp. nov.** (Plate IX, Fig. 1.)

Antennæ dark mouse gray, white at base. Labial palpi whitish above, dark gray below (that is in front). Face and head white. Thorax white with four longitudinal dark mouse-brown stripes. Fore wings elongate, caudate, dark mouse brown; in the middle of the wing from base to beyond end of cell a broad spindle-shaped longitudinal white band; between this and the dorsal edge is a short white longitudinal streak beginning about the middle of the wing and becoming narrower and fainter outwards, losing itself in the dorsal ciliæ. At the end of the central white band are three white streaks, one below and two above, converging towards a common point just before apex, in the costal cilia are three short nearly perpendicular streaks converging towards the same point, which is of a somewhat lighter yellowish gray color, than the rest of the wing. Apical cilia white with black tips and a transverse dark streak above the produced tips of the wing, while below it is white with gray tips and two very distinct deep black round dots one above the other at base. Dorsal cilia light yellowish gray. Hind wing dark gray; cilia with a golden sheen; abdomen dark gray, anal tuft yellowish. Alar expanse 12.5–14 mm.

Habitat: Texas.

U. S. National Museum, type no. 5353.

Co-type in Lord Walsingham's collection.

Described from six specimens reared by Mr. Th. Pergande from *Acacia farnesiana*.

The larva, which is very dark, nearly black, with black head, was found by Mr. E. A. Schwarz to web up and feed between the leaves of the above tree in the streets of San Diego, Texas.

The moth, while easily distinguished from the smaller lighter golden type of the genus *luteostrigella* Cham., is still very close to it in general appearance and in habit.

The food plant of *P. luteostrigella* Cham. is *Cassia chamaecrista*, on which the larva, which is difficult to detect, spins together the leaflets. I have reared this species repeatedly in the District of Columbia in late July and early August.

The only other described species of this genus from the American continent is *P. senstrigella* Cham. A much smaller species, diverging considerably from the two others in coloration, but agreeing well generically. Lord Walsingham's three West Indian species are evidently quite distinct from any of the continental forms. Judging from the description and figure, *acaciella* Busck seems to resemble most *Polyhymno cleodorella* Walsingham, described from Africa.

Neither Chambers' nor Walsingham's delineation of the wing of *luteostrigella* (Journ. Cin. Soc. Nat. Hist., Vol. II, 1880, Plate III, Fig. 26, and Trans. Ent. Soc. Lond., 1891, Plate VII, Fig. 78) is very good, and gives no true idea of this elegant form. Chambers' venation is wrong, even with his MS. correction, published by Mr. Beutenmüller, and Walsingham's figure does not show the caudate apex sufficiently. Fig. 1, Plate IX, is drawn from *P. acaciella*, but is identical in venation and form with the wing of *P. luteostrigella* Cham.

CECOPHORIDÆ.

Triclonella, gen. nov.

Antennæ four-fifths, slightly serrate and ciliate, basal rather long but simple with pecten. Labial palpi long, smooth, recurved; second joint somewhat thickened with appressed scales, terminal joint long, but shorter than second. Maxillary palpi obsolete. Face, head and thorax smooth. Fore wings elongate ovate, pointed; 12 veins, 7 and 8 stalked, rest separate. Hind wings under I; costa depressed from middle to apex, anal angle rounded; 8 veins, 6 and 7 parallel, 3 and 4 stalked, 5 out of the stalk of 3 and 4. Posterior tibiae hairy above.

Type: *T. pergandella* Busck.

Triclonella pergandeella, sp. nov. (Plate IX, Fig. 2.)

Antennæ purplish black, with two silvery white, thin, longitudinal lines from base to tip. Labial palpi black, second joint with four longitudinal thin silvery white lines, terminal with one longitudinal white line in front. Tongue thinly scaled, white. Face and head brownish black with a thin white line over the eyes. Thorax clear light golden brown concolorous with basal part of fore wings. Abdomen purplish black. Fore wings, basal half light yellow brown with a small black, white-edged dot on the middle of the cell. The brown color extends along the costa into the apical half of the wing, the ground color of which is purplish black, edged towards the brown part by a thin white line. In the black part of the wing are scattered sparse white scales segregating into a whitish spot near tornus; basal part of cilia black sprinkled with white scales, tips of cilia mouse gray. Hind wings purplish gray, darker towards the tip; cilia brownish. The venation of the hind wing shows more variation than is generally found within a species. White veins 3 and 4 are always stalked and 5 always out of this stalk, the relative length of the branches and the stalk is very variable. Legs purplish black, coxæ sprinkled with silvery scales; hind tibiae with one broad silvery annulation and with the outer spurs silvery white, inner spurs black; tarsi with indistinct silvery annulations. Alar expanse 14 mm.

Habitat: District of Columbia.

U. S. National Museum, type no. 5354. Cotypes in the collections of Dr. Meyrick, and Lord Walsingham, England, Dr. Dietz, Miss Murtfeldt and Professor Fernald. Described from many bred specimens. The larva feeds on the common tick-trefoil, *Melilotia* (*Desmodium*) *dillenii*.

The eggs are laid singly on the underside of a leaflet and the larva lives in a roomy inclosure between two leaflets spun together. When full grown it is about 12 mm. long, cylindrical, slightly depressed and tapering fore and back. Legs normal; head is yellow with a black spot over the eye and one on top; body black marked with yellow as follows: Anterior half of first thoracic joint; a continuous dorsal spot and two lateral spots on second and third thoracic segments; two small dorsal dots on segments 5, 6 and 7 (counting head as first joint); joints 8 and 9 have the same two dorsal spots larger and more conspicuous besides two lateral spots, one on each side. End of body all black; entire body clothed with rather short sparse white hairs.

Dr. Dyar has given me the following description:

“Head rounded, elongate, the lobes full; clypeus high, the paraclypeal pieces narrowly reaching the vertical triangle; labrum longer than wide, projecting, emarginate; surface shagreened; setæ pale, some long, others short; pale luteous, a black patch at top of lobe next suture, and a broad blotch on the lower angle of cheek behind ocelli; ocelli weak, in a black patch; antennæ moderate, pale. Thoracic feet large; abdominal ones small, slender, normal, the crochets in a complete small circle, smaller and almost broken on the outer side; in a single row on the

anal feet, the posterior half of the circle being obsolete. Cervical shield rectangular, the posterior angles rounded, bisected on dorsal line, complete as to its setæ; not strongly cornified, pale, a large black patch on posterior lateral angle and a small one on anterior angle. Tubercles normal, distinct, brown-black, with rather long pale setæ. On thorax ia and ib well separated, iia + iib, iv + v; on abdomen, i dorsad to ii, iv and v in line, remote, vi normal, vii of three setæ in a nearly straight line on a common elongate tubercle, viii normal. Feet surrounded by black, chitinous ring-shields. Skin smooth, blackish; a pale yellowish patch about tubercle i, large on joints 3, 4, 8 and 9, small on the others, absent on 11; a lateral patch about tubercle iii, large on joints 2, 3, 4, 8, 9 and 12, small on the others; smaller patches about iv and v and before vi on joints 3, 4, 8, 9 and 12. Anal flap blackish, paler centrally, not cornified."—Harrison G. Dyar.

When younger, the larva is of a much lighter appearance, the yellow predominating. It is very agile and runs quickly forwards or backwards and lets itself fall on a silken thread, if the leaves are not carefully handled. When ready to pupate it enlarges its cell by adding the third leaflet, and suspended by a slight web a thin white half-transparent oval cocoon is spun inside the cell, in which the larva transforms to a rather robust light brown pupa.

There are two or three overlapping generations yearly in this locality, the moth issuing late in June and late in August and sometimes again late in September.

The species over-winter as imago. The imago is very retired in its habits and is not taken at light.

I believe this species is very local; I have reared the moth in numbers for three successive years, but all taken within a limited area on the eastern side of the eastern branch of the Potomac River. Although the food-plant is common everywhere I have, though diligently seeking, never found it elsewhere, not even in other parts of the District of Columbia apparently similar in nature. I have not seen a single specimen in any of the collections except those reared by myself. Neither had Miss Murtfeldt, Dr. Dietz or Professor Fernald ever met with it, and such a conspicuously marked insect would be likely to be remembered if once met with.

I have named this, the first Tineid I ever reared, in honor of my friend and teacher Mr. Th. Pergande, under whose guidance I have had the good fortune to be initiated into the closer study of insect life in the field and in the insectary.

***Triclonella villella*, sp. nov.**

Labial palpi light yellowish brown, blackish on the outside. Face, head, thorax and anterior wings unicolorous light yellowish brown, the same shade as in *pergan-*

deella, without markings of any kind. Posterior wings shining yellowish fuscous, cilia golden brown. Legs yellowish brown, tarsi on the outside blackish. Alar expanse 15 mm.

U. S. National Museum, type no. 5355.

Described from a single female reared by Mr. Pergande accidentally from *Xolisma* (*Andromeda*) *ligustrina*, collected at Cabin John, Md., for another purpose.

Larva not observed and food-plant therefore not absolutely certain. The species has somewhat narrower fore wings than the type of the genus but agrees in all respects with the generic description and is clearly closely related to *pergandecella*.

Euclemensia schwarziella, sp. nov. (Plate IX, Fig. 3.)

Antennæ bluish metallic black. Labial palpi light silvery strawcolored with tips darker. Head and thorax deep bluish metallic black. Fore wing bluish black with strong metallic reflections. At basal third is a transverse irregular fingered bright red or golden fascia, narrow in the middle, broadening out in one outwards and two inwards lobes or fingers at costal and dorsal edge. At the middle of the wing on costal edge are a few silvery white scales; at the beginning of the costal cilia is a large white dash, edged below by a red spot, and at the beginning of the dorsal cilia is another white spot, edged above with red. The shade of the red on the wing varies in different specimens, as is the case in *E. bassettella* Clem, from a nearly golden yellow to a rich deep red. Hind wing purplish black. Abdomen bluish metallic black; legs metallic black; hind tibiae with two silvery annulations, one at the middle and one at the end, and with spurs silvery white. Alar expanse 11-12 mm.

Habitat: Santa Rita Mountains, Arizona.

U. S. National Museum, type no. 5356.

Described from six specimens, collected by Mr. E. A. Schwarz and reared from a kermes species on oak sent by him. The moth issued in June through a sharply cut circular hole, the lid of which still adheres to the kermes.

This species has the same colors as, but a very distinct pattern from the common *E. bassettella* Clem. The generic characters are identical.

I name this beautiful species in honor of the collector, who has added many new and interesting species to the material in the U. S. National Museum.

ELACHISTIDÆ.

Scelorthus, gen nov.

Antennæ simple, nearly as long as fore wing. Labial palpi porrected, short, smooth, pointed. Maxillary palpi obsolete. Tongue long, naked, spiraled. Head

smooth. Fore wings narrow, slender, lanceolate, pointed, smooth; costa somewhat depressed at middle of wing. 10 veins, 4 and 8 absent, all separate, 7 to costa, 1^b forked at base. Hind wings under 1, lanceolate, 6 veins, 3 and 4 absent, cell open, 5 and 6 stalked from independent stem, 7 independent. Hind tibiae smooth with two groups of long, stiff bristles above the spurs, one at the middle, the other at the end. At rest the hind legs are stretched upwards above the wings.

Type: *S. pisoniella* Busck.

This genus resembles very much *Lithariapteryx*, Chambers (Can. Ent., Vol. VIII, p. 217, 1876), in head, wing form, venation and general habitus; but it is distinguished at once by the two groups of bristles on posterior tibiae and differs also in the forewing by having vein 1b distinctly and greatly furcate at base while in the hindwing the submedian vein is simple.

Scelorthus pisoniella, sp. nov. (Plate IX, Fig. 4.)

Antennae metallic black. Labial palpi purplish white. Face silvery. Head and thorax shining greenish aureous. Fore wing purplish gray with blue and silvery reflections. At base is a dorsal aureous patch and at the middle of the wing is a narrow transverse aureous fascia; at basal fourth is a small black costal dot, surrounded by metallic purple scales. Cilia dark ashy gray. Hind wings silvery gray becoming darker outwards towards the top where they are shining purplish black. Cilia with a golden sheen. Abdomen above metallic purplish black, below silvery white. Sides of thorax below the wings golden. All coxae silvery white, tibiae and tarsi purple; spurs and spines on hind tibiae black. Alar expanse 8.5 mm.

Habitat: Palm Beach, Florida.

U. S. National Museum, type no. 5357. Cotype in collection of Dr. Meyrick, England.

Described from four specimens, bred in February from *Pisonia obtusata*, collected by Dr. Harrison G. Dyar.

The moth is a shining, elegant little form, related to and reminding one of *Heliodines*. The following are Dr. Dyar's notes on the larva:

"The larva lives on the leaves of *Pisonia obtusata*, at first mining between the upper and lower epidermes, later eating little patches on the back of the leaf through to the upper epidermis from a position in a central white web, covered by a lump of frass which adheres to the web. In one instance the larvæ were found on *Pisonia aculeata* with the same habits.

"Slender, moniliform, joint 13 narrower; transparent whitish-green, tubercles represented by tiny black dots. Head flattish, the clypeus high, nearly touching the vertical triangle; whitish, ocelli black, mouth pale brown. Tubercles i and ii are in

line, i, a trace dorsad; iv and v separate, iv dorsad; vi on the lower subventral fold. Feet short, slender, the abdominal ones on joints 7 to 10 and 13. Dorsal vessel slightly darker than the rest of the body; ♂ glands colorless. Later darkish green, the dorsal tubercles purplish-black. On the thorax tubercles 1a and 1b are separate, 1a small; one tubercle representing ii, one representing iv + v, but only one hair seen on each distinctly, the other minute. Pupa in the web, flat and wing-margined, green with diffuse brown-black dorsal stripe on the abdomen."—(Harrison G. Dyar.)

Lamprolophus, gen. nov.

Antennæ $\frac{3}{4}$ slightly serrate. Labial palpi very short, straight, pointed, drooping. Maxillary palpi obsolete. Tongue long, naked, spiraled. Fore wing elongate, ovate pointed, apex produced and deflexed, termen sinuate; with raised scale tufts; 11 veins, 8 absent, all separate, 7 to costa, 1b simple. Hind wing lanceolate, 7 veins, 4 absent, cell open, 6 and 7 stalked, 5 from independent indistinct stem 2 and 3 stalked. Posterior tibiae with a row of short stiff hairs above.

Type: *L. lithella* Busck.

Lamprolophus lithella, sp. nov. (Plate IX, Fig. 5.)

Antennæ dark metallic purple. Labial palpi golden yellowish. Face, head and thorax shining black with strong metallic green and purple reflections. Fore wing, ground color deep metallic purple with strong golden reflections, on the middle half of the wing are four equidistant costal raised scale tufts and intermediate between these are three dorsal scale tufts all strongly metallic silvery or golden bluish. At the base is a dorsal golden yellow patch; just before the last two scale tufts are a costal and a dorsal golden yellow spot and in the apical part of the wing are two parallel longitudinal golden yellow streaks. Cilia purplish gray.

The golden reflections of the wing make a realization of the true colors difficult; in some lights the wing looks all golden, in others all silvery bluish. Hind wing silvery at base and along costa, outer half purplish black; cilia dark purple. Abdomen dark metallic purple above, below light golden or silvery according to the light. Legs golden purple with a narrow white bar at the end of the posterior tibiae and with all spurs light silvery. Alar expanse 9 mm.

Habitat: Palm Beach, Florida.

U. S. National Museum, type no. 5358. Co-types in the collection of Dr. Meyrick, England. Described from four specimens bred in February from *Pisonia aculeata*. The following are Dr. Dyar's notes on the larva:

"The larva bores in the young stems of *Pisonia aculeata*. It spins a slight web above the base of a young leaf and enters the stem, leaving a round hole from which the frass is ejected.

"Cylindrical, the segments short and rather thick, faintly 2-annulate. Translucent sordid whitish, no marks. Tracheal line white; ♂ glands dark ochreous. Tubercles small, brown-black, i and ii nearly in line, iv and v approximate but distinct, iv slightly dorsad, iii, vi and vii normal. Feet small, pale except the anal pair which are

broadly black ringed. Anal plate large, black; also extensive black plates on joint 12, single for tubercle i and tubercle ii, paired including tubercles iii to v and the spiracle; joint 12 is small and hunched up, 13 still smaller, scarcely divided by a suture. Skin slightly shining, minutely granular. Cervical shield elliptical, bisected, black. Head round, free, slightly bilobed, higher than wide, black, shading to brownish below; clypeus high; ocelli black. Tubercles ia and ib are separate on joints 3 and 4."—(Harrison G. Dyar.)

HYPONOMEUTHIDÆ.

Hemerophila dyari, sp. nov. (Plate IX, Fig. 9.)

Antennæ nearly three-fourths black with silvery white annulations and with two longitudinal rows of cilia on the underside; length of cilia twice the thickness of the antennæ. Labial palpi moderate, curved ascending; second joint long, slightly rough in front, white with one black annulation; terminal short, thickened, blunt, black, with one ring round the middle and with the extreme tip white. Maxillary palpi obsolete. Tongue well developed, spiraled. Face, head and thorax smooth, very dark olive-green, nearly black, evenly and thickly sprinkled with golden yellow scales. Basal two-fifths of fore wing concolorous with thorax and equally evenly sprinkled with yellow scales. This basal part is sharply edged by a narrow, somewhat undulating, transverse line of bluish white scales, most pronounced on the costal half of the wing. Outside of this line the wing has a very perceptible but not easily defined purplish sheen. The ground color is the same as in the basal part of the wing, but the more thickly sprinkled light scales are of a purplish white color, which dominates this part of the wing and makes it appear much lighter colored than the basal part. Towards the end of the wing the light scales become gradually fewer and nearly golden yellow again as on basal part of the wing, but the bluish cast remains. Just at apex the triangular corner of the wing is so thickly overlaid with golden scales as to appear all gold; this part is separated from the other by a deep black narrow line from costal edge to middle of termen. Along the outer edge of the wing runs a deep black line. Cilia dark purplish fuscous with strong metallic blue reflection. Hind wing dark olive-brown, cilia purplish with golden yellow base. Abdomen above deep bluish black, below with a light golden yellow transverse band on each segment. Legs golden with black annulations. Underside of thorax yellowish white. The underside of the wings dark olive-brown; the apical corner of the fore wing, corresponding to the golden upper part, is golden yellow; along the base of the cilia is a deep black line corresponding to that on the upper side. Alar expanse, 14 mm.

Habitat: Palm Beach, Florida.

U. S. National Museum, type no. 5362.

Described from a single bred male in perfect condition, issued in March.

The venation of this species (Plate IX, Fig. 9) is as follows: Fore wing tortricid-shaped, 12 veins, all separate, 2 distant from corner of cell, 3–10 from end of cell, 7 to termen, 8 to costa, 16 fur-

cate at base, internal vein from between 11 and 10 to between 8 and 7. Hind wing over 1 triangular, 8 veins, 3 and 4 short-stalked, 5, 6 and 7 parallel.

I take pleasure in naming this beautiful species after its discoverer, Dr. Harrison G. Dyar.

Only one other species of this genus, *H. (Simethis) vicarialis* Zeller is recorded from North America. This species is unknown to me except from description, but it is evidently entirely different from *H. dyari*.

The breeding of this species from *Ficus* agrees with the known food-habits of other tropical species of the genus as recorded by Meyrick.

The genus *Walsinghamia* Riley is very near to *Hemerophila*, differing principally in the thickened antennæ. It agrees perfectly in wing form and venation. The difference in labial palpi is so slight that it is unfortunate that Professor Fernald has used it as a differential character in the synoptic table of his valuable paper on these and allied genera (Can. Ent., 1900, p. 238). He calls the third segment of the labial palpi in *Walsinghamia* long and pointed, while I should decidedly call it short and blunt, very little longer indeed than in *Hemerophila*. Long and short are relative terms, susceptible of varying interpretation and therefore I think Professor Fernald's table would have been improved by placing *Walsinghamia* under the same number as *Hemerophila* and then using the antennal character to separate.

The common food-plant and peculiar larval habits further confirm the close relationship of these two genera.

The following are Dr. Dyar's notes on the larva:

"The larva lives on the leaves of the rubber banyan tree (*Ficus aurea* and *F. pedunculata*). When small, on the back of a leaf under a delicate silken tent; when large on the upper surface under a similar broad web spun flat on the leaf across the slightly concave upper side. The larva eats holes through to the lower epidermis in a patch about half an inch in diameter under the web. These patches remain even on old leaves, showing the characteristic traces of the larva, though the delicate web is evanescent and disappears almost as soon as the larva quits it. The larvæ are very active, falling to the ground with contortions when disturbed. Each remains in its web only long enough to eat one or two patches, when it proceeds to a new leaf to form a fresh web. They are always solitary at maturity, though sev-

eral may be found in a common web when small and still living on the back of the leaf. Three stages were observed, all similar except in size; widths of head .6, .8, 1.1 mm."

Head rounded bilobed, clypeus reaching over half way to vertex, mouth projecting; a long dark spinneret; antennæ short, but palpi distinct; lobes and clypeus bulging, labrum distinctly emarginate; green, ocelli black, labrum brown edged, setæ black; width 1.1 mm. Body a little flattened, tapering a little at the anterior end and more so posteriorly; anal feet divergent, projecting, the other abdominal ones short; thoracic feet large, bent at right angles centrally like claws. Segments 3-annulate, the anterior annulet very small. Tubercles small, concolorous, a little elevated; i and ii in line, iv and v united; on the thorax ia and ib united, iia and iib united and iv and v likewise, all normal. Setæ distinct, moderate, pale, but black on the concolorous and invisible cervical shield and anal plate. Green, clear, uniform, the dorsal vessel darker, feet whitish green. The active and sensitive larva spins its delicate web with great rapidity.

Cocoon a mass of moist silky web on the top of a leaf or other suitable place resembling the larval tent, but much larger and containing centrally an imperfect tube with a ribbon of white silk at the top. The pupa is pale green without marks and can wriggle up and down the tubular part of the cocoon, at will."—(Harrison G. Dyar.)

Food-plants: Ficus, spp.

TINEIDÆ.

Leucoptera smilaciella, sp. nov. (Plate IX, Fig. 6.)

Antennæ golden white, basal joint enlarged to a considerable eye cap, silvery white. Face smooth, silvery white. Head tufted, silvery white. Labial and maxillary palpi obsolete. Thorax and fore wing silvery white; from middle of costa obliquely outwards reaching to the middle of the wing is a golden yellow streak with parallel dark edges; between this and apex is a triangular golden yellow spot also thinly edged with black; at tornus is a conspicuous deep black spot followed on the outside by somewhat raised bronzy silvery scales, and on the inside and above surrounded by a narrow golden yellow area. Just before apex is a longitudinal short golden yellow streak; apical cilia white with dark fuscous tips and two transverse dark fuscous streaks; dorsal cilia gray. Hind wing dark purplish brown nearly black, cilia a shade lighter. Abdomen dark fuscous above, light silvery fuscous below. Anal tuft white; legs golden white, posterior tibiae hairy. Alar expanse 7.5–8.5 mm.

Habitat: District of Columbia, Pennsylvania.

U. S. National Museum, type no. 5359. Co-types in collections of Murtfeldt, Fernald, Dietz, Walsingham and Meyrick. Described from many bred specimens.

Food-plant: Smilax glauca, and *S. rotundifolia*.

The eggs, which are laid on the underside of a leaf singly, but

often 2-5 on one leaf, are oval, glistening white and very large in proportion to the moth.

The young larva eats into the leaf, forming a short, narrow, serpentine track, which soon broadens out in a large irregular upper blotchmine, often entirely obliterating the early part of the mine. The mines show reddish brown on the upper side of the leaf and contrast very conspicuously with the dark-green foliage. The black frass is distributed irregularly in the mine, the inside of which is a dirty domicile for such a dainty creature to issue from. The larva is, when full grown, 5.5 mm. long moniliform, somewhat flattened and tapering backwards; first thoracic segments the broadest, nearly twice as wide as the head. Head light brown, body dark, glossy-greenish with two longitudinal black spots on first thoracic segment; and legs normal. Often two to five larvæ are found within a common large mine.

Dr. Dyar has made the following notes:

"Head flattened, subcircular, labrum slightly projecting, clypeus band-shaped but narrowed above, reaching vertex; paraclypeal pieces large, broad, each nearly as broad as the clypeus itself, narrowed above, reaching vertex and reducing each lobe to about one-fourth of the surface of the head. Ocelli obsolescent, antennæ rudimentary. Body moniliform, joints 2 and 3 large, 4 and 5 smaller, 6 to 11 larger, 12 and 13 tapering rapidly, 13 elongate, divided. Feet normal, thoracic ones small, abdominal short with a complete, broad ellipse of small, sparse, scarcely recurved crochets; those of joints 7 to 10 and 13 essentially alike. Whitish, no marks, no shields, but a paired blackish patch in joint 2. Tubercles absent, setæ very fine and slender, practically absent except laterally, iv and v in line remote, iv a trace dorsad; only iii and iv are at all well developed. On thorax the subprimaries iii and iv are present."—(Harrison G. Dyar.)

When fully grown the larva quits the mine through a moon-shaped cut in the upper epidermis and spins a beautiful glistening white bridgework, consisting of two parallel broad flat silken bands each about 10 mm. long and 1.5 mm. wide, connected at the middle, under which the spindle-shaped snow-white cocoon proper is made.

Several overlapping generations are found during the summer in this locality, the moth issuing from the middle of June to late in September. The insect over-winters as imago. Besides two Florida species described by the writer only one other species of this genus is described from this country, namely *Leucoptera* (*Cemiostoma*) *albella* Chambers, on poplar; but diligent rearing will disclose more undescribed species, as I have taken others at light this summer.

It will be seen from the delineation of the venation (Plate IX,

Fig. 6) that this species differs in some respects in the fore wing from that given by Dr. Meyrick as characteristic of the genus; but the *tout-ensemble* of the insect, the larva and the cocoon is so evidently close to the European forms, that I do not hesitate in placing it in the same genus.

The venation of the present species is: Fore wing, 10 veins, 4 and 8 absent, all separate, 7 to costa, 1b furcate at base. Hindwing: 6 veins, 3 and 4 absent, cell open between veins 2 and 5.

***Tinea oregonella*, sp. nov.** (Plate IX, Fig. 7.)

Antennae dark fuscous. Labial palpi brownish, both joints tipped with white. Maxillary palpi very short white. Face and head rough, yellowish white. Fore wing rusty white, somewhat variably marked with dark brown, nearly black, longitudinal streaks. The two most conspicuous and constant are one on the fold reaching from the base to the apical third of the wing and one in the middle of the wing, reaching from basal third to apex. At the base of wing is a costal and a dorsal less conspicuous streak and along the edge of the wing is a more or less regular row of dark brown spots; cilia white, dusted with reddish brown. Hind wing dark gray, cilia yellowish. The ground color of the wing varies somewhat in different specimens, being pure dull white in some while in others it is reddish or brownish; and with the exception of the two first-mentioned heavy streaks all the other markings are sometimes nearly effaced, while in other specimens they are emphasized. Also the color of the streaks is somewhat different in different specimens ranging from brown to pure black. Legs white; tarsi with black annulations, tuft on hind tibiae yellowish. Alar expanse 15-17 mm.

Habitat: Oregon.

U. S. National Museum, type no. 5360. Co-types in the collections of Murtfeldt, Fernald, Dietz, Meyrick, Walsingham, and may be obtained for any other collections where they may be desired.

Described from some 300 specimens bred from a large woody Polyporus-like fungus on Redwood, containing about half a cubic foot, collected in Oregon by Dr. H. von Schrenk, and kindly turned over to me by Mr. E. A. Bessey, of the Division of Vegetable Pathology, U. S. Dept. of Agriculture.

When I received the fungus many moths had already issued, more than two hundred, in fact, from an actual count of the protruding empty pupa-skins.

I placed the fungus in a covered glass jar and during the following week (late September) more than six hundred more moths issued. The fungus was a curious sight, looking like a strange hedge-hog, with the closely-set projecting empty pupa-skins sticking forth like spines.

Eucatagma, gen. nov.

Antennæ simple, a little more than half as long as fore wing, basal joint with well-developed eye cap. Labial palpi moderate, somewhat curved, porrected, smooth, pointed; maxillary palpi obsolete. Tongue well developed, naked, spiraled. Face and head smooth; fore wings rather broad and short oval, 12 veins all separate, 7 to termen, 1b furcate at base; between vein 11 and the dorsal edge a thickened opaque area. Hind wings I, costa deflexed from middle of wing, 7 veins, 4 absent, all separate. Posterior tibiæ smoothly scaled.

Type: *Eucatagma amyrisella* Busck.

Eucatagma amyrisella, sp. nov. (Plate IX, Fig. 8.)

Antennæ light silvery gray. Eyecaps silvery white. Labial palpi silvery gray. Face, head and thorax pure white. Fore wings silvery white, marked with a soft flannel-like gray as follows: Six indistinct equidistant small transverse spots just below costal edge from base to apical third; two large areas on dorsal half of the wing separated by a narrow irregular white line, the first and largest one occupying the middle third of the wing, the other smaller one at tomas; three small transverse spots at apex; cilia brownish with a thin white transverse line. Hind wing silvery gray, apical third darker, cilia lighter silvery. Abdomen white. Legs white with dusky tarsi. Alar expanse 10 mm.

Habitat: Palm Beach, Florida.

U. S. National Museum, type no. 5361. Co-type in collection of Meyrick, England. Described from two specimens issued March 12, 1900.

The following are Dr. Dyar's notes on the larva:

"The larva spins a delicate open web among the very young leaves of *Amyris floridana*, not drawing the leaves together or distorting them in any way. It rests on a stem or leaf, not on the web.

"Head .8 mm. wide, slightly bilobed, the lobes full; clypeus high and broad, green, ocelli black, mouth brown. Body slender, cylindrical, not tapering; segments not annulate; feet normal; subventral fold rather prominent. The circle of crochets of feet complete; green, translucent; dorsum heavily darkly shaded from numerous fine dark red mottled lines, becoming more sparse and dotted towards the ends and only faintly traced on joint 2, which looks green. The dorsal ground color appears as about six fine longitudinal irregular lines. Tubercles small, black; i dorsad to ii, iv and v in line, approximate but distinct on the subventral fold; vi distinct; vii on the leg base, a group of three hairs. On joints 3 and 4 tubercles ia and ib are separate, iia and iib united in a large, round, elevated, deep black tubercle. Setæ fine, pale. No plates. The pupa is formed in the web and is colored green."—(Harri-son G. Dyar.)

Food-plant: *Amyris floridana*.

EXPLANATION OF PLATE IX.

FIG. 1. Venation of *Polyhymno acaciella* Busck.

- " 2. " " *Triclonella pergandeella* Busck.
 " 3. " " *Euclemensia schwarziella* Busck.
 " 4. " " *Scelorthus fisoniella* Busck.
 " 5. " " *Lampralophus lithella* Busck.
 " 6. " " *Leucoptera smilacella* Busck.
 " 7. " " *Tinea oregonella* Busck.
 " 8. " " *Eucatagma amyrisella* Busck.
 " 9. " " *Hemicrophila dyari* Busck.

♦

IN MEMORIAM: REV. DR. GEORGE D. HULST.*

BY ARCHIBALD C. WEEKS.

The Rev. Dr. George D. Hulst was stricken with neuralgia of the heart on the morning of November 5, 1900, as he was preparing to visit some sick members of his congregation, and expired almost immediately.

Upon arising in the morning he complained of having suffered much pain during the night, and summoned his family physician, who prescribed a simple remedy and remained at the house until it was obtained, Dr. Hulst meanwhile genially rallying him upon its potency and character, and apparently as buoyant and animated as usual. After the departure of the physician he sat by the window resting his head upon his hands, and as his daughters came through the hall he rose to speak to them. Hardly had he done so than he sank slowly to the floor, death being instantaneous and as surprising as it was unexpected. He had never had what might be termed a sick day, and by his lifelong habits of temperance had retained to a remarkable degree his boyish activity and sprightliness. Only the day before, while conversing with members of his congregation, he had spoken of his excellent health.

*An address delivered before the New York Entomological Society, December 4, 1900.

Notwithstanding the urgent demands upon his time and endurance by his profession, he was about preparing to summon together his long-known friends and sympathizers in the pursuit of entomology, renew the associations which had been interrupted for several years by his engagements, and toil with undiminished energy toward the completion of his investigations in the branches of that science to which he had particularly devoted himself for a number of years.

Dr. Hulst at the time of his death was the pastor of the South Bushwick Reformed Church, at Bushwick Avenue and Himrod Street, Brooklyn, and had held this position from the beginning of his ministry, July 4, 1869. An unbroken pastorate extending through so many years would seem to be all the evidence required to prove his worth and the affection and esteem of his congregation for him. But this is not all. Charity and works with him went hand in hand. Every honest seeker after employment received from him a courteous hearing and aid to the extent of his power. Over one hundred distressed families were said to have been relieved by him during a period of so-called hard times. The funeral services were held in the church where he had ministered so long, and so large was the attendance that fully one-half of those assembled were unable to gain admission.

He was born in the old Duryea Homestead at the Penny Bridge, Brooklyn, on March 9, 1846, attended Jonesville Academy in Saratoga County, N. Y., entered Rutgers College at New Brunswick, N. J., and received in addition to his diploma a gold medal from that institution for his proficiency in the classics. He was graduated from the Theological Seminary in 1869. From his boyhood he had manifested a deep interest in nature, especially in plant and insect life, and this interest, supplemented by painstaking study, had justly raised him to a high rank as a botanist and entomologist. His knowledge and attainments in these sciences were always at the service of the public, and the humblest seeker after information received equal courtesy and consideration from him.

Notwithstanding the demands of his congregation upon his leisure, and without neglecting his duties to them, he still found opportunity for the exercise of his natural inclinations and talents. He delivered a course of lectures upon entomology at Rutgers College, and for a time acted as State Entomologist of New Jersey; was one of the editors of *Entomologica Americana*, a publication of the Brooklyn Entomological Society, from 1887 to 1889, and served that society as a

member in many capacities for a number of years. He was also a member of the New York Entomological Society and a member of the Brooklyn Institute of Arts and Sciences, being President of its Department of Botany and an officer of its Department of Entomology, and annually delivered lectures before these departments in their respective courses. For twenty years he had been a member and subsequently a Fellow of the American Association for the Advancement of Science, an honor conferred upon him in recognition of his scientific researches and attainments, and for like reason he received from his own College the degree of Doctor of Philosophy. He was one of the first members of the Holland Society, tracing his descent from the Von Holst family, who at an early period settled in Brooklyn, and from whose name his own was derived.

It is unnecessary to give in detail a list of Dr. Hulst's numerous contributions to botanical and entomological literature. Many of the latter consist of short papers upon miscellaneous subjects, scattered chiefly through the Bulletin of the Brooklyn Entomological Society, published from 1878 to 1885, *Entomologica Americana* published from 1885 to 1890, *Journal New York Entomological Society*, and the *Transactions of the American Entomological Society*, in which latter the majority of his descriptions of species appears.

He worked in both macro- and micro-lepidoptera, and described many species in various genera of both divisions. One of his principal papers is a very complete synopsis of the genus *Catocala*, published in the June (1884) number of the Bulletin. He also did much systematic work in the Phycitidæ and Epipaschiinæ, but his best efforts seem to have been reserved for the Geometridæ, in which family his described species outnumber those of any other author. It had been his ambition to place the knowledge of this intricate and troublesome family upon an orderly and exact basis, and it is to be deeply regretted that he was unable to realize the fruition of his hopes in the cause of entomological learning.

His collection of Geometridæ was one of the best, if not the best, in the country. Many of his types were deposited in the Museum of the Brooklyn Institute, but his collection of lepidoptera was some years ago donated and delivered to Rutgers College, Dr. Hulst only retaining in his custody such portion as he required for study and comparison.

His widow, two daughters and one son survive him.

ENTOMOLOGICAL WRITINGS OF THE LATE REV. GEORGE D. HULST.

BY WILLIAM BEUTENMÜLLER.

- 1878. Larval and Pupal Stages of *Darapsa versicolor* Harr. (Can. Ent., Vol. X, 1878, p. 64.)
- 1879. The Scientific Names of Insects. (Can. Ent., Vol. XI, 1879, p. 22.)
- 1879. Letter relating to What Constitutes a Genus. (Can. Ent., Vol. XI, 1879, p. 39.)
- 1879. A Correction. (Can. Ent., Vol. XI, 1879, p. 80.)
- 1878. Notes on *Smerinthus geninatus*. (Bull. Bklyn. Ent. Soc., Vol. I, 1879, p. 67.)
- 1879. Notes on *Deiopeia bella*. (Bull. Bklyn. Ent. Soc., Vol. I, 1879, p. 83.)
- 1879. Notes on *Samia cynthia*. (Bull. Bklyn. Ent. Soc., Vol. I, 1879, p. 91.)
- 1879. Notes on a Trip to Florida. (Bull. Bklyn. Ent. Soc., Vol. II, 1879, p. 19.)
- 1879. The Uses of Cocoons. (Bull. Bklyn. Ent. Soc., Vol. II, 1879, p. 27.)
- 1879. Abnormal Larvæ. (Bull. Bklyn. Ent. Soc., Vol. II, 1879, p. 35.)
- 1879. Hints on Rearing Lepidoptera. (Bull. Bklyn. Ent. Soc., Vol. II, 1879, p. 63.)
- 1879. *Macroglossa thysbe*. (Bull. Bklyn. Ent. Soc., Vol. II, 1879, p. 38.)
- 1880. Capture of Rare Butterflies. (Bull. Bklyn. Ent. Soc., Vol. II, 1880, p. 81.)
- 1880. Food-Plants of Lepidopterous Larvæ. (Bull. Bklyn. Ent. Soc., Vol. II, 1880, p. 175.)
- 1880. Notes on *Nemoria Chloroleucaria*. (Bull. Bklyn. Ent. Soc., Vol. II, 1880, p. 78.)
- 1880. Descriptions of New *Catocala*. (Bull. Bklyn. Ent. Soc., Vol. II, 1880, p. 96.)
- 1880. Remarks on the Genus *Catocala* with a Catalogue of Species and Accompanying Notes. (Bull. Bklyn. Ent. Soc., Vol. III, 1880, pp. 2-13.)
- 1880. Description of Some New Species of Geometridæ. (Bull. Bklyn. Ent. Soc., Vol. III, 1880, p. 41.)
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TWO NEW SESIIDÆ.

BY WM. BEUTENMÜLLER.

***Sesia mariona*, sp. nov.**

Female. Head white, vertex pinkish; collar pale pinkish above, white beneath; palpi white. Antennæ black, with a greenish lustre. Thorax green black with a very large bright red patch on each side in front, contiguous with the bright red line on each side above. Abdomen and anal tuft wholly metallic green black. Legs metallic green black, anterior coxæ white. Fore wings metallic green black with a broad, bright red line along the inner margin; extreme edge of costa pale testaceous or dirty white. Hind wings brown with a violaceous lustre, central part with two transparent areas, the upper one broken by the discal mark. Underside of wings brown with a decided violaceous lustre, costal margins pale testaceous. Expanse, 17-20 mm.

Habitat: Trimble and Pagossa Springs, and Durango, Colorado, July 6, 19 and 30, 1899.

Types: Two females. Coll. Dr. William Barnes, Decatur, Illinois. One female. Coll. Am. Mus. Nat. Hist.

Described from three females. The male and earlier stages of the species are unknown.

***Sanninoidea græfii*, var. *barnesii*, var. nov.**

Female. Head, thorax and legs entirely metallic blue-black. Abdomen blue-black, with the fourth segment above orange. Fore wings opaque blue-black. Hind wings transparent with the margin blue-black. Expanse, 28 mm.

Habitat: Clear Creek Cañon, Colorado, August.

Type: Coll. W. Barnes, Decatur, Illinois. Like the type form, but has the fourth abdominal segment orange above, giving it the aspect of the female of *Sanninoidea exitiosa*.

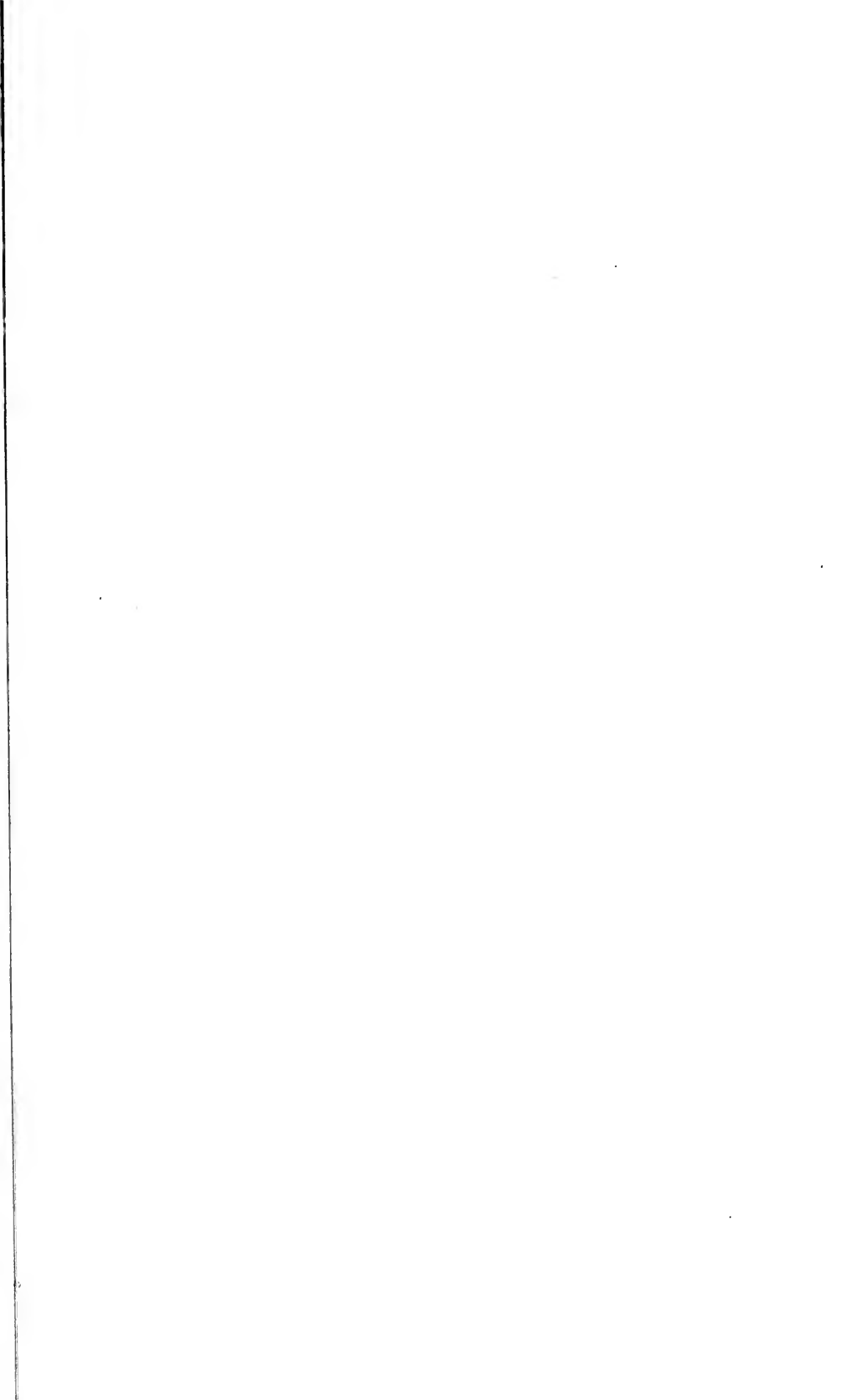
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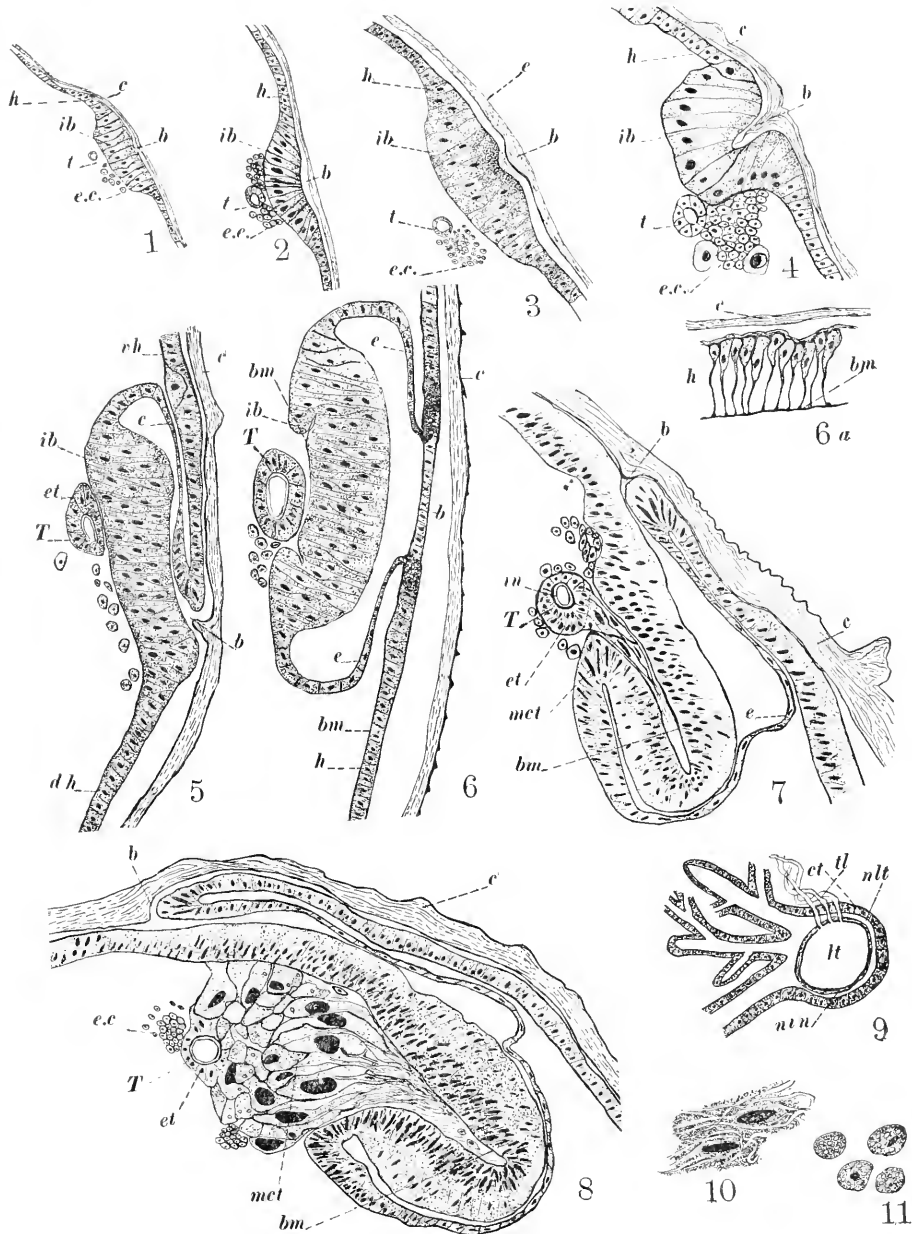
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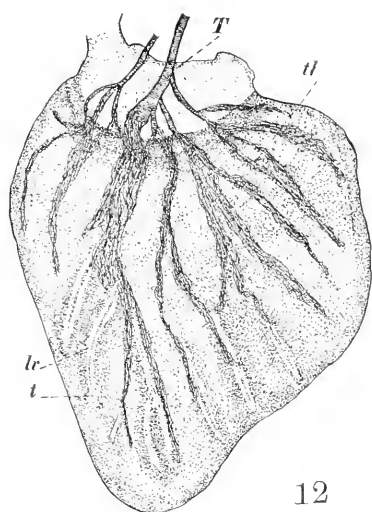
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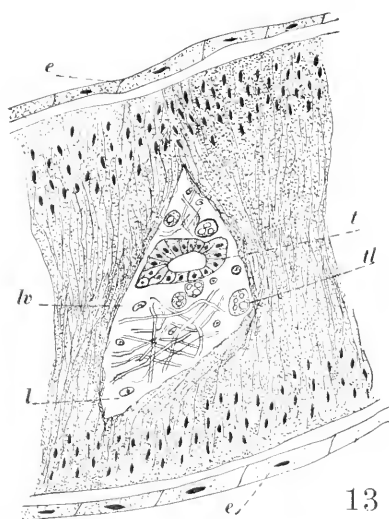




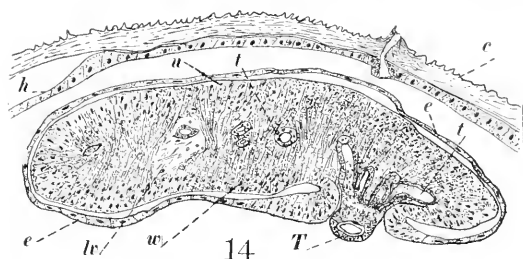
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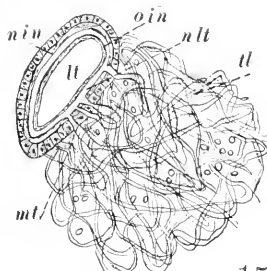
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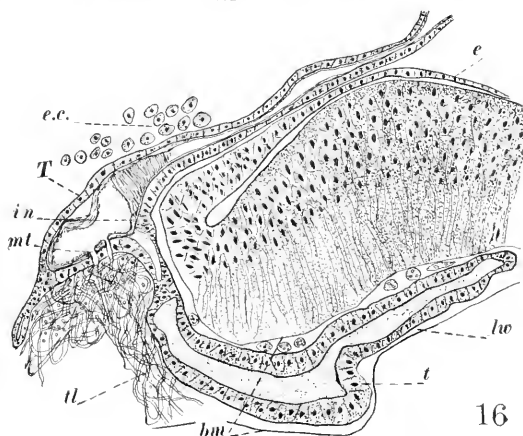
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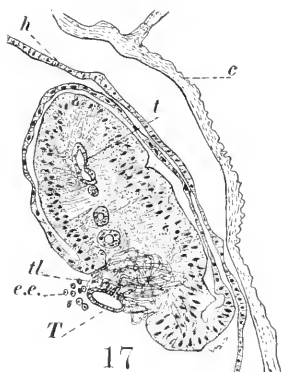
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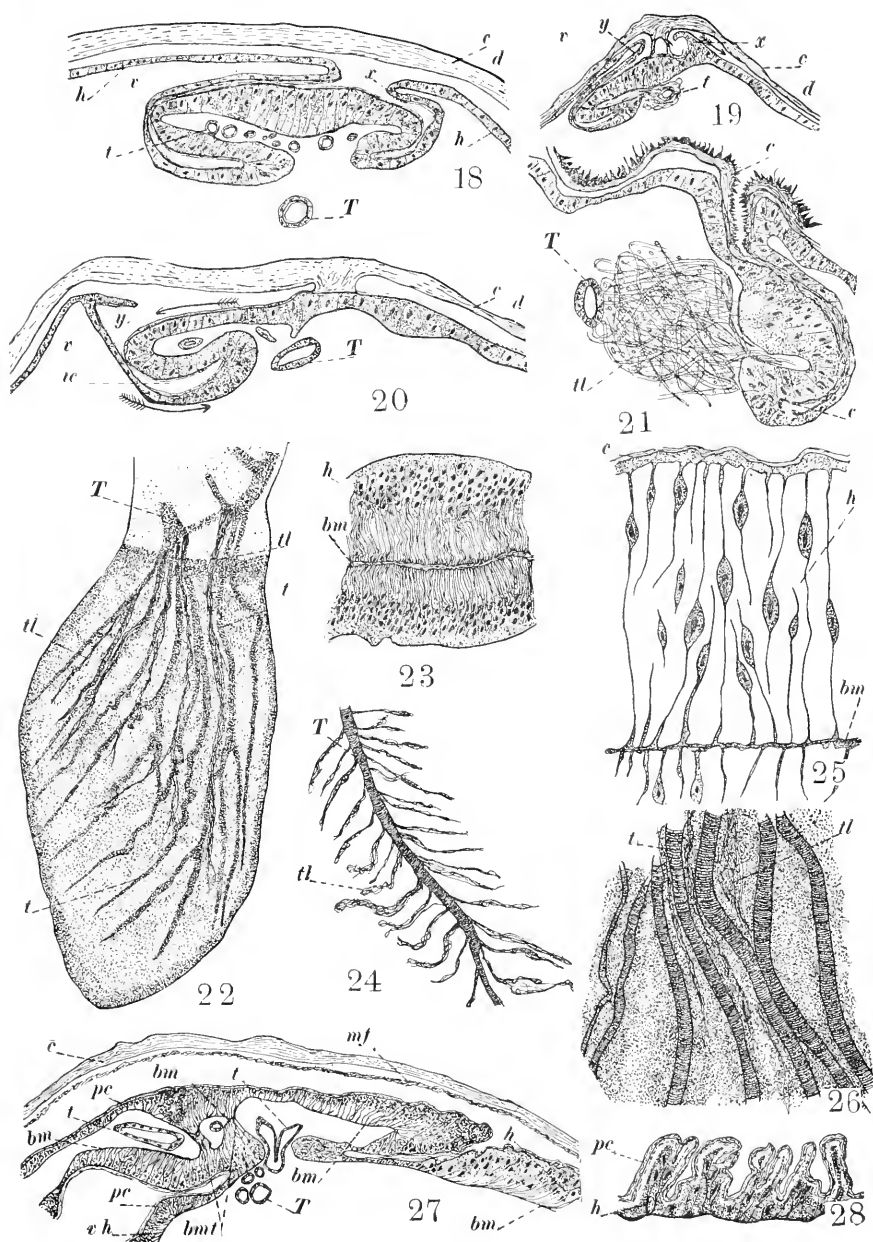


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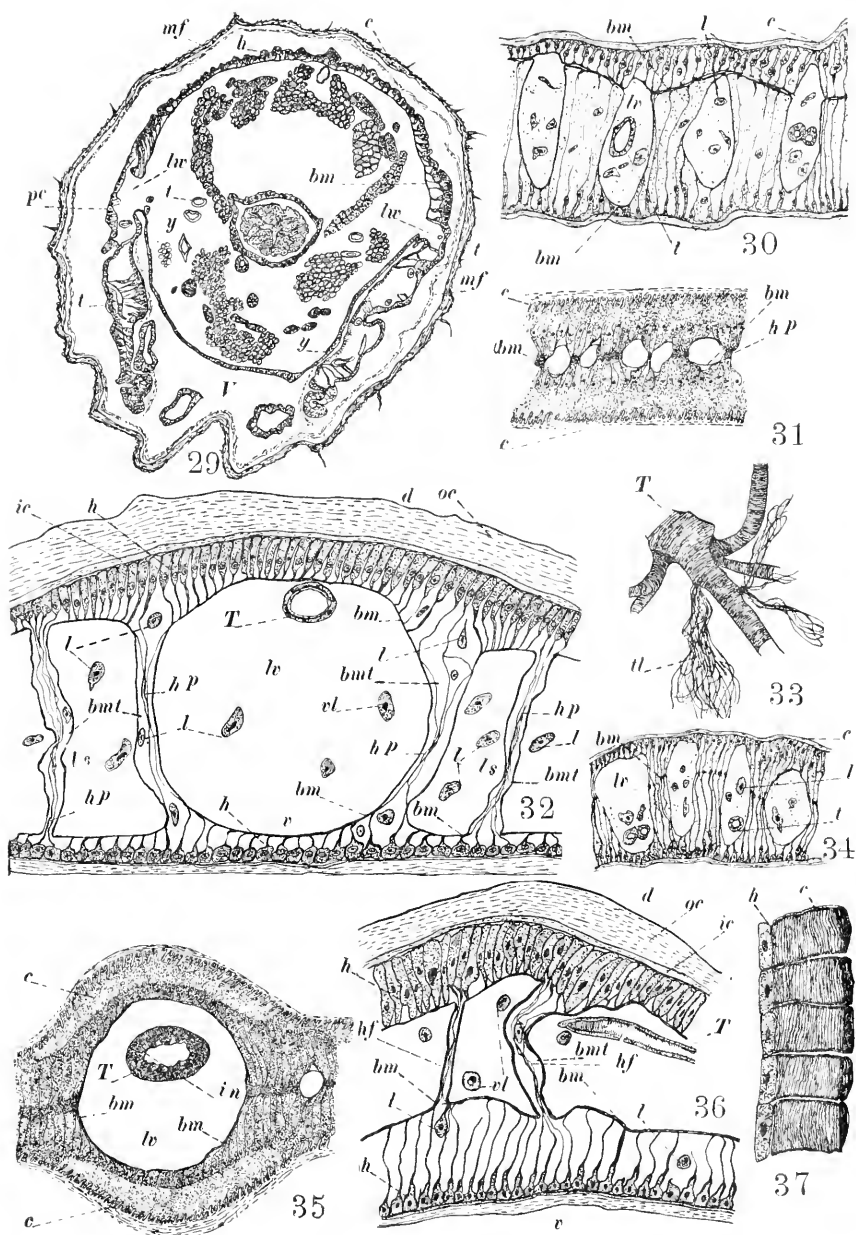


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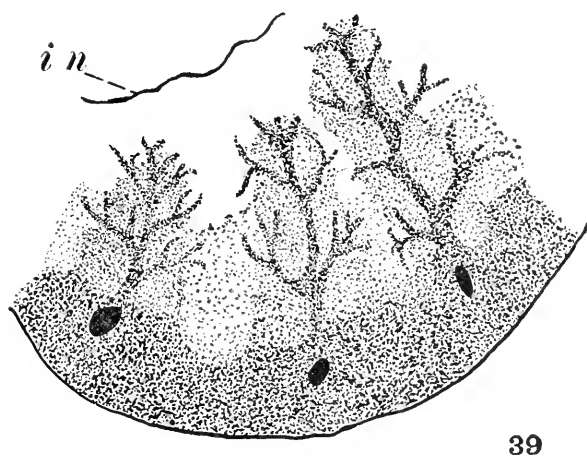
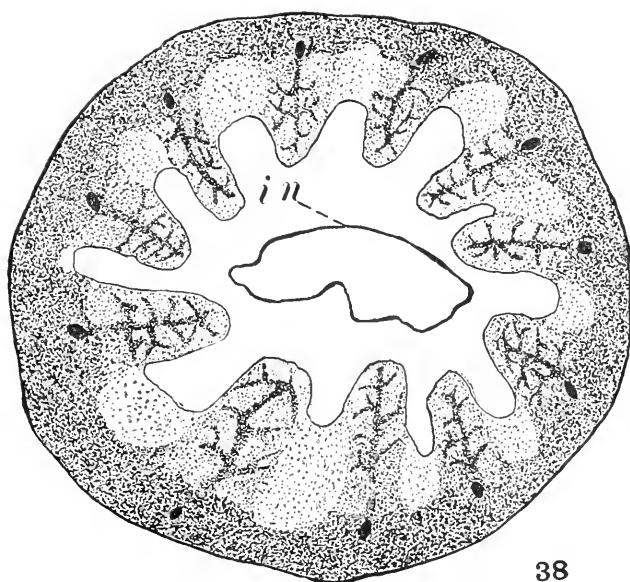
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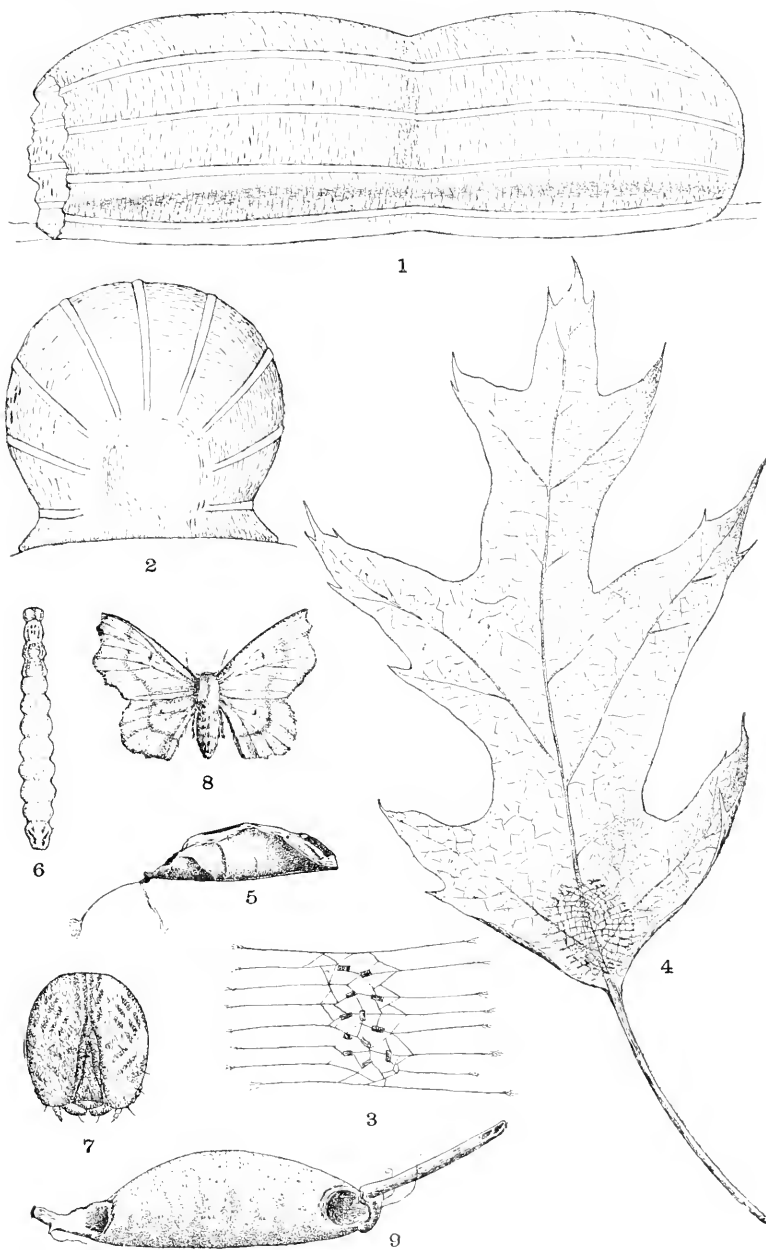
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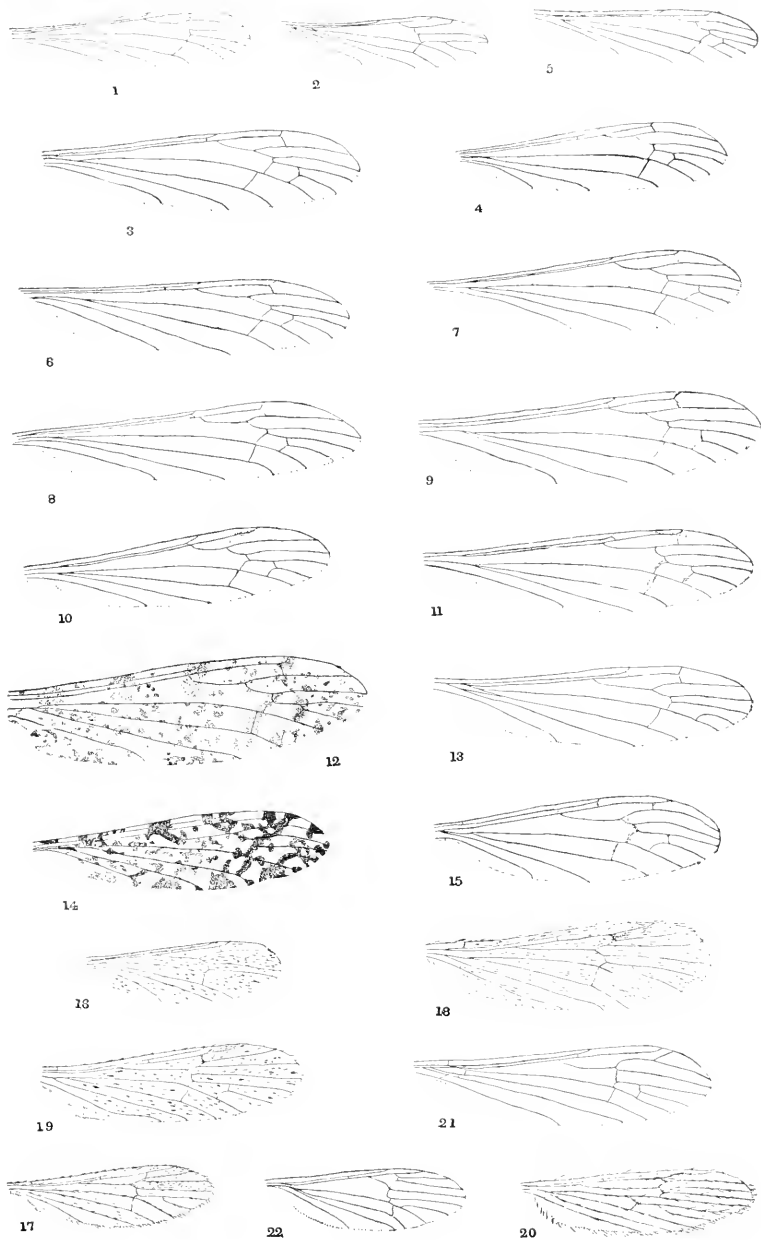
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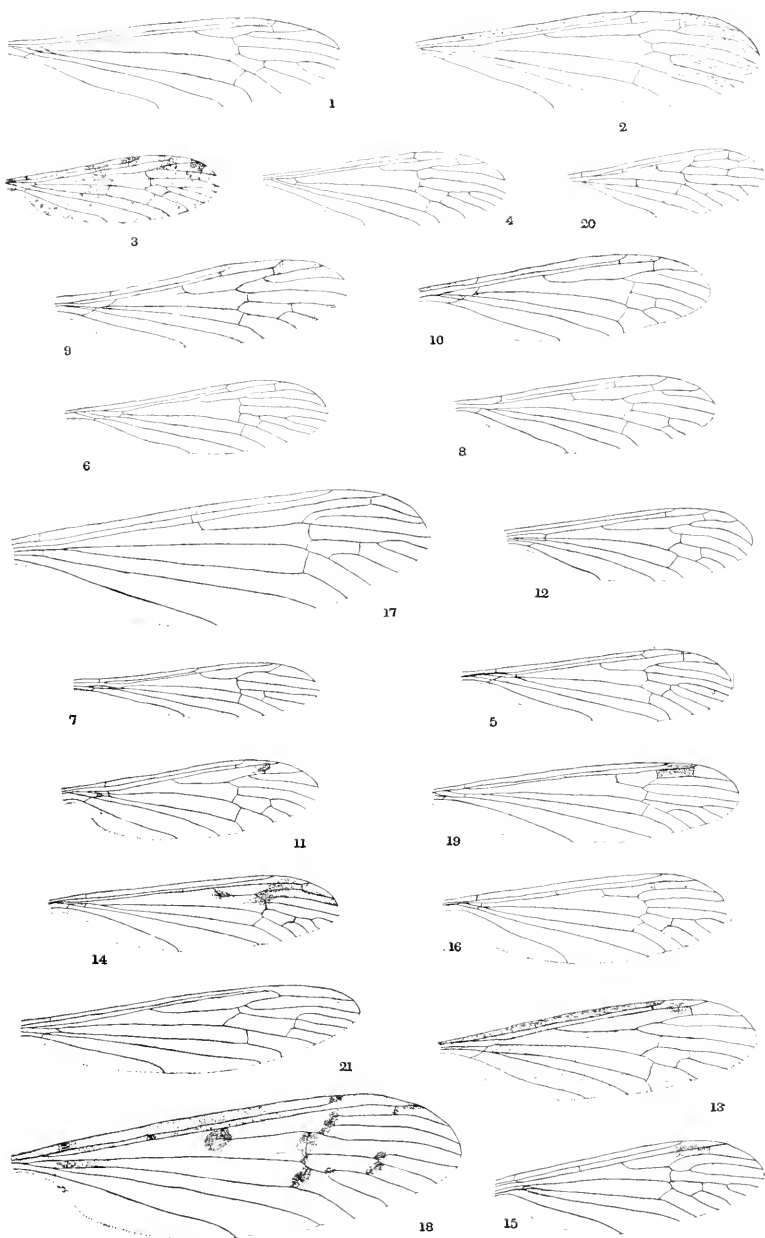
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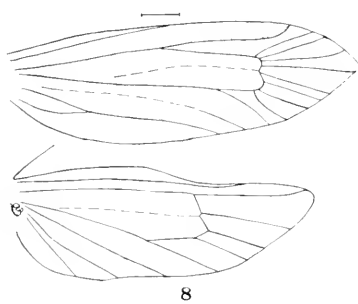
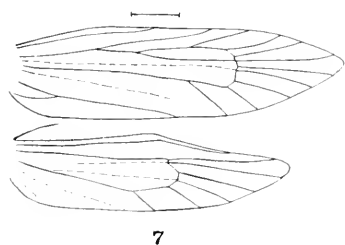
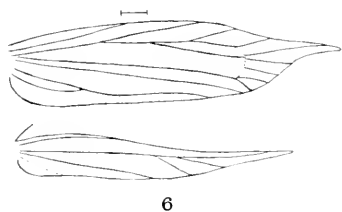
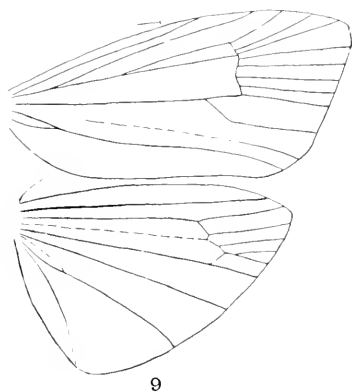
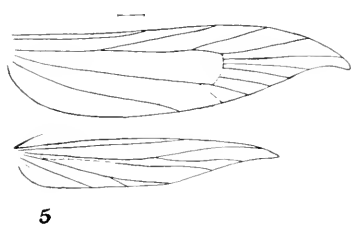
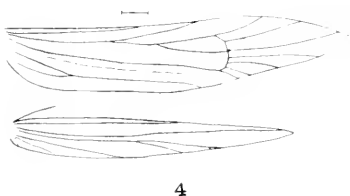
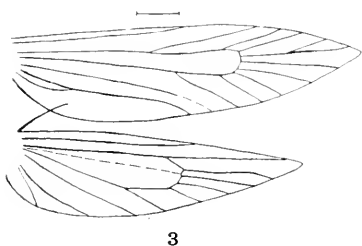
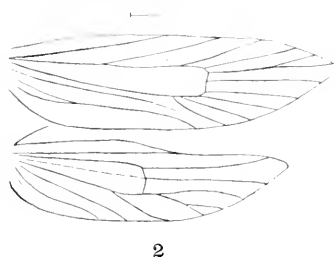
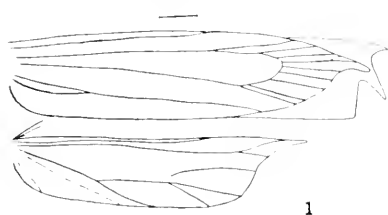
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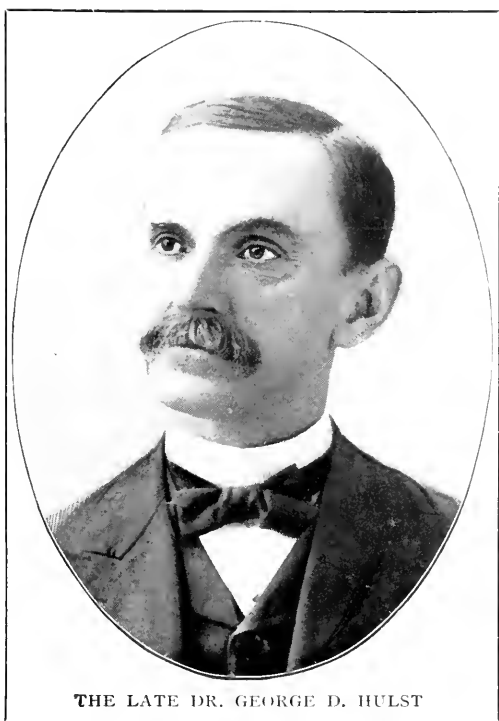


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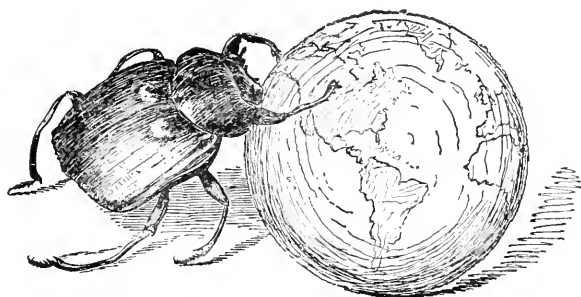


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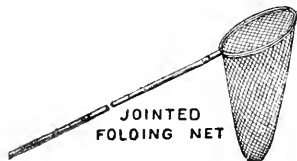
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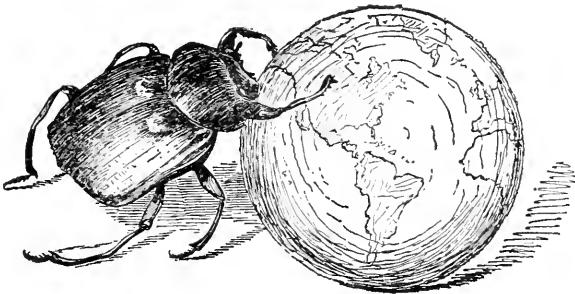
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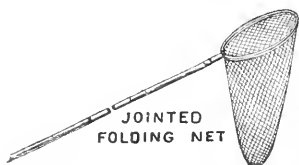
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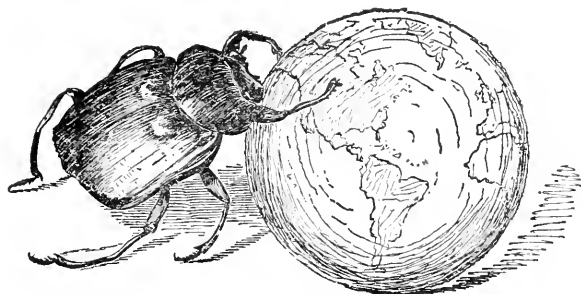
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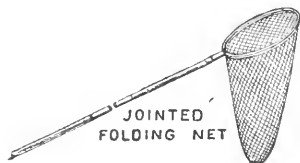
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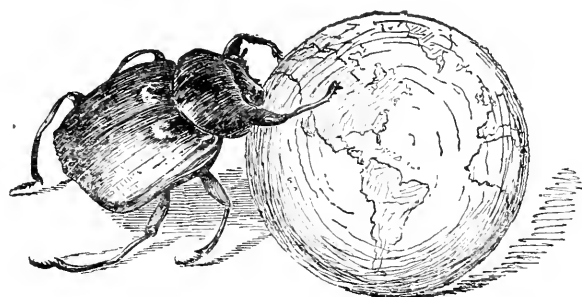
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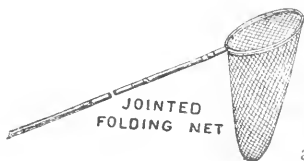
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